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ABSTRACT

A study examined the nonformal extension education impacts of farming systems research in three prototype areas in rural Lesotho. The extension education programs that were carried out in Lesotho from 1979 through 1984 in conjunction with a farming systems research development strategy were found to have tentative, but indicative, impacts on farmer contact groups, chiefs, headmen and headwomen, and district-based extension workers and subject matter specialists. The farmer contact group members studied felt that the extension activities changed their knowledge, attitudes, skills, and aspiration levels. The extension program also appeared to result in higher crop yields, more income from farming, and an increased ability to acquire better farm inputs. The chiefs and village headmen and headwomen studied likewise found the extension program to have a number of positive impacts and were unanimous in their support for farming systems research as a development strategy. The district-based extension workers and subject matter specialists interviewed also indicated that the extension program had positive impacts in many subject areas taught. Farming systems research was found to be a useful development strategy in that it is interdisciplinary and engages the farmer directly in its dynamics. This does not mean, however, that the strategy should be viewed as a panacea for the low agricultural productivity that affects much of Africa. (A sample interview form is appended.) (MN)

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EXTENSION EDUCATION IMPACTS OF FARMING SYSTEMS RESEARCH IN LESOTHO

(ABRIDGED)

BY

DAVID VANCE YOUMANS

THE UNABRIDGED VERSION WAS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF EDUCATION IN THE FACULTY OF EDUCATION: DEPARTMENT OF THE HISTORY OF EDUCATION AND COMPARATIVE EDUCATION AT THE UNIVERSITY OF THE ORANGE FREE STATE

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BLOEMFONTEIN
1986

NOTE: IN THIS ABRIDGED VERSION THE LITERATURE REVIEW OF NONFORMAL EDUCATION AND EXTENSION EDUCATION ALONG WITH APPENDED MATERIALS HAVE BEEN OBMITTED.

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PREFACE

Over the past few years the Research Institute for Education Planning has expanded its research programme to include aspects of non-formal education directed at community development in rural areas and programmes for school-leavers only in developing countries. This was made necessary by the failure of formal education to reach these underdeveloped areas and address their real development needs. The majority of the rural poor have received very little, if any, formal schooling and skills training. The same applies to training in food production. This explains why non-formal education programmes, inter alia in the form of extension education, are vital to the crucial problem of rural poverty.

This publication is an abridged version of a doctoral thesis by D V Youmans on the extension education impacts of farming systems research on three prototype areas in Lesotho. He undertook the study with myself as promotor and Proff C S Blignaut and J van der Merwe as co-promotors.

Farming systems research is an integrated strategy for rural development making ample provision for the local farmers to interact and participate. It seeks to orient agricultural investigation in such a way that scientists and poor farmers become partners. The findings of the research of Youmans throws new light upon the impact of such extension programmes on the behavioural change of small farmers in rural areas.

A special word of thanks to the following people and instances:

- Prof C S Blignaut, Head of the Department of Agricultural Economics at UOFS, for consistently bringing an agricultural focus to a research effort in extension education.

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PROF D VERMAAK
DIRECTOR: RIEP

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CHAPTER I INTRODUCTION

1.1 ORIENTATION

Nonformal education is today a generic label which identifies a family of educational activities which happen outside the formal school system and which provide learning opportunities for people not easily reached by the formal system. One sector of those activities addresses the continuing needs of the employed labour force. Agricultural extension education is a familiar example. It is that form of nonformal education developed specifically for agriculture. Thus extension education prevails worldwide in the agricultural context. Another sector attempts to prepare people, mainly youth, for entry into the labour force. Many vocational training programmes are typical of that endeavour. A third sector seeks to provide learning experiences which transcend the world of work, such as adult literacy, survival skills and cultural enrichment courses. All forms are adaptable toward meeting the needs of the rural poor, the population most neglected by the world's formal education systems. Development strategists now admit that nonformal education including extension education is vital to the crucial problem of rural poverty worldwide. While leading thinkers search for integrated approaches to improving productivity and enhancing the quality of life for countless millions, the rural sector of the developing world is being urged to produce more food even while suffering the debilitating effects of poverty on their own lives.

Agricultural development strategies have followed one upon another for decades. Colonial concepts gave way to erroneous assumptions about technology transfer. Appropriate technology models were largely unable to break their ties to westernized "top-down" theories, and the technology "packages" which produced the Green Revolution, with the exception of India, have fallen on hard times. In short, there have been decades of failure, punctuated by rare and sporadic successes, in agricultural and rural development endeavours. It is now widely felt that community based, integrated approaches may hold the last best hope for the immediate and long range future in coping with rural poverty, and that nonformal education must be a critical component in development formulae henceforth.

It is not that the value of education per se was ignored in former years. Certainly, post-colonial times have seen the expansion of formal school systems and university programmes, with unprecedented overseas study opportunities for Third World nationals. But only recently has it been fully realized that formal schooling does not adequately address the real issues of rural poverty, nor do returning "technocrats" effectively come to grips with the reasons for the low productivity of rural families within their own countries. The expansion and upgrading of formal education systems is applauded, for it most certainly has its vital place in developing societies. Nonformal education must complement, rather than replace formal systems. But, in the case of rural development, it is nonformal education which must take the lead since the rural poor are now, and presumably will always be, hopelessly outside the reach of formalized school networks.

To state that nonformal education is not formal is not to insinuate that it is not organized. Indeed, it is organized nonformal education which is critical to the grass-roots, self-help, integrated strategies for rural development because it can be "transported" to the scene of dire need, it can address needs directly at low cost, it can be flexibly moulded to "fit" villagers' perceptions of their environments, its results can be quickly reinforced, and learners can participate in their own self-enlightenment.

Farming systems research (FSR) is one such strategy that seeks to orient agricultural investigation in such a way that scientists become problem solvers in partnership with poor farmers whose productivity is constrained by factors and situations as they perceive them. By understanding the farming "system" as such farmers envisage it and interact with it, scientists contribute to mutually discovered innovations which should have an enhanced probability of being tried and ultimately adopted by the farmers who share in the discovery. It is likewise expected that mutually discovered innovations and technologies generated in partnership with poor farmers will be more readily accepted by a wider rural population living under similar constraints than will potential "solutions" handed down by researchers and educators remote to environmental realities as seen through farmers' eyes. Finally, it is expected that extension educators in developing countries will see the wisdom of the strategy and systematically promote knowledge and skills, generated by FSR, among farming communities.

At every step in the FSR strategy, extension education is critical since poor farmers are partners in the entire process. Those farmers must be encouraged to replicate and share potential solutions to farm problems, which they themselves help discover, through purposeful and proactive extension education dynamics. Diplomaed or graduate extension educators must become part of the FSR strategy intellectually and experientially since extension education is the key to the diffusion of desired change.

1.2 NONFORMAL EDUCATION*

Contemporary development strategists have reached agreement on two basic operating premises. First, development must become integrated and participative in order to endure. And second, nonformal education must be central to strategies designed to meet the needs of the rural poor. The challenge to nonformal education posed by world poverty in the rural areas demands creativity, commitment and massive support in order to help forestall and hopefully reverse the effects of famine, pestilence, human outrage, deteriorating resources and unprecedented destitution around the globe.

Development appears in modern times wearing many hats, espousing many schemes and prescribing many cures. Yet, the recognizable statement that the poor will always be with us has never rung more true. While technology has reached dizzying heights in recent years, rural poverty has reached global dimensions and its devastation of humanity and the earth environment is accelerating. Amidst the wreckage are found the relics of decades of misguided and failed development schemes, the goals and objectives of which somehow ran aground.

---

* A full chapter on nonformal education has been omitted from this abridged version.

The early 1980's have seen a rethinking among major donor organizations and nations of the components and dynamics of development. New formulae have been conceived for development funding, focusing especially on the needs of the rural poor. These new formulae call for an integrated rural development approach which touches on all aspects of rural life. Among those are agricultural productivity, the condition of women and children, the plight of minorities, rural employment and role of the people in the development process (Coombs, 1980 p.1).

Community-based self-help emphases have become a vehicle for integrated rural development in the 1980's and major national, international and voluntary funding agencies have made public policy statements reflecting that redirection of focus. As a prerequisite for new programmes of this type, agencies have begun to place emphasis on getting to know the rural poor (Coombs 1980, p. 12), understanding their problems as perceived by poor family householders and involving beneficiaries in both planning and programmes. That philosophy strongly influences the central rationale of farming systems research and extension, as will be seen in Chapter 2.

Nonformal education plays a central and critical role in meeting the needs of the rural poor. The trend of development from purely economic, trickle-down schemes toward more holistic, multi-dimensional approaches has been amply documented. The plight of the rural poor has been studied and found to be much more complex than a study in economics. The rural poor in the developing world are shown to be a vast resource potentially capable of shouldering much of the burden of their own development.

A key for unlocking that potential strength is nonformal education which holds inherent characteristics that make it appropriate for the development challenge. Nonformal education is short-term, specific, and non-credential based. It can be recurrent and part time. Clientele determine the standards and content of nonformal education which is output-centered and individualized. The delivery systems for nonformal education can be community based, learner-centered, and flexibly structured, along self-governing democratic lines.

In a developing world in which most rural adults and growing numbers of youth are alienated and disenfranchised by inadequate formal education systems, nonformal education holds a last best hope for a better tomorrow.

1.3 EXTENSION EDUCATION*

It is widely accepted that "extension education" or simply "extension", is appropriate nomenclature for the practice of nonformal education in agriculture. As in the case of reference to the wider practice of nonformal education in the world context, problems of description are faced by Kelsey and Hearne (1949, p.1), in a classic tome on extension. They define it as an out-of-school system of education in which adults and young people learn by doing, and which seeks as its fundamental objective the development of people.

The history of extension in Europe is more than a century old. Sanders and Maunder (1973, p. 25) claim that the term "extension education" was coined at Cambridge University as early as 1873 to describe a unique extramural educational innovation at that time in Britian, and that travelling teachers of agriculture were to be found in several European countries even earlier.

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* A full chapter on extension education worldwide has been omitted from this abridged version.

The Cambridge model extended subject matters of that great and ancient university to people where they lived and worked, and strongly influenced similar educational movements in other British and American universities. Public funds from county councils in England were among the first grants to the extension movement historically documented.

A brief history of extension education in the U S is presented by Sanders (1973, pp. 13 - 19) who explores the legal base, scope, functions and general objectives of the programme. His treatment of the educational nature and focus of extension work is particularly useful. It describes the educational process as strictly nonformal with no fixed curriculum or course of study, conferring no degrees nor diplomas and using homes, farms and public places as classrooms. Sanders describes the extension educator as one having a broad field of subject matter which is highly practical and is organized for immediate problem solving among a large heterogenous audience. The participation of that audience in educational programmes, Sanders explains, is voluntary but the application of the subject matter to participant problem solving requires real behavioural change.

The field of extension is broad, though it tends to concentrate on agriculture and home economics, uses a variety of nonformal educational methods, and is farm family focussed. Extension is likewise research linked, flexible, practical and dynamic, and can be brought to bear on the expressed local needs of people, according to Sanders. It utilizes a vast network of local leaders and aggressively promotes the application of practical information.

The use of lay leadership in extension education programming is important, Trent (1973, pp. 123 - 136) suggests. Under the best of circumstances, extension educators are too few, and the added thrust that can be given to extension by interested, active and coordinated participation by lay and volunteer leaders is much too important to ignore. Trent says that lay leaders fall into the two broad categories of action leaders and opinion leaders, and that both perform vital roles in extension programmes. They may be subdivided, according to Trent, as organizational leaders, subject matter leaders, activity leaders and programme advisors. He further explores ideas about the identification, selection, recruitment, motivation, training and evaluation of lay leadership.

Rose and Tapson (1984, pp. 172 - 174) trace extension as an agricultural movement in South Africa back to 1924 when legislation was passed creating the division of agricultural extension within the Department of Agriculture. The RSA now operates seven extension regions and thirty-three sub-regions, according to the authors, with competent extension personnel deployed as required. Until 1955, extension in the Black states centered largely on soil conservation and erosion control. The focus shifted after the new 1955 policy consensus toward agricultural stabilization, reclamation and rehabilitation. Several of the Black states now operate their own departments of agriculture and are setting their own priorities for agricultural extension. Special problems in the Black areas require a unique approach to agricultural education, research and extension, according to Rose and Tapson.

Claar, Dahl and Watts (undated) deal very effectively with several factors which influence extension in developing countries. Extension must help farmers do the best job possible within the context of existing opportunities. In areas where agricultural infrastructure is weak, a good deal of cooperation and linkages must be pursued in such areas as inputs, credits and markets. Where agricultural research is not strong, appropriate information must be borrowed from countries which have dealt with like problems under similar conditions. Agricultural extension programmes in developing areas address production and home utilization as well as marketing. Thus, education must look at food preservation and post harvest storage as well as production and marketing topics. Extension educators in poor countries must consider the complexity of the learning process and seek appropriate methodology mixes, and they must be especially sensitive to family and cultural values. While western agricultural economists persist in defining farmer behaviour in economic language, these authors caution that developing farmers seek low cost techniques which will assure subsistence but are reluctant to risk expenditure on innovations even when greater incomes are highly likely. They claim that "in general, low capital accumulation, lack of production inputs, low current earnings, cultural factors, old age, previous bad experiences in farming (such as drought) and inadequate markets all tend to reduce the importance of profit in decision-making and increase the importance of other factors. In those cases, efforts to transmit technology that involve high cost outlays and risks may encounter serious problems".

Farmer experience with low quality or undependable inputs can seriously hinder extension progress. Low literacy among farmers may inhibit effective extension through western methodology. Extension educators must seek methods which are compatible with the learning patterns or learning potential of their clientele. Radio has had many successful applications in Third World countries, especially when used with some sort of supplemental instruction; but there are also instances of notable failure of radio extension. Demonstrations, both method and result types, are generally useful and are recommended in the emerging nations, but again they must be organized with all the sensitivity necessary to ensure mutual respect between educator and farmer. A degree of learner participation in demonstrations is usually desirable. Despite the fact that mass media, such as radio, have severe limitations in terms of in-depth instruction and credibility, they do retain strength with respect to reaching large numbers of people and creating awareness of extension programmes. Claar, Dahl and Watts conclude that "developing a more effective extension system is a common quest in many countries, especially those that need to greatly expand production and utilization of food. Many existing systems have been recognized as very inadequate, especially in developing countries. A major goal in any such countries is to improve the production and utilization of food through a more effective extension service. Consequently, this will also be the focus of a great many assistance programmes of the future".

Watts and Claar (1983, pp. 3 - 13) are convinced that extension is a necessary component to agricultural development and can work. They warn against being slaves to inappropriate systems and argue the importance of appealing to farmers' pride, perceptions of their environments and their peculiar satisfactions. They feel that "our job in extension, then, is not only to disseminate research, but also to make it appealing, attractive, and above all, beneficial to the individual families working on the farms of Africa, Asia, Latin America, and the Middle East".

Committed, skilled, sensitive extension workers can successfully demonstrate improved and appropriate technology and persuade farmers to adopt more productive practices, according to Watts and Claar. They cite a number of experiences in the Third World and describe how horizontal networking, supported by mass media, has been so successful in China. They think the match between systems and needs in the emerging world is generally poor and call for bold, new approaches which are being witnessed in such concepts at the training and visit system of extension and farming systems research. They call for a recognition on the parts of both donor and emerging nations that extension is neither indicental nor an add-on to programmes to raise agricultural productivity, but rather a highly sophisticated professional field which operates on principles vital to development itself.

1.4 THE FIELD OF THIS STUDY

This study addresses the role of extension education in farming systems research in the Kingdom of Lesotho from 1979 - 1984 as practised by Washington State University faculty members, under contract with the United States Agency for International Development and in integrated collaboration with personnel of the Research Division of the Lesotho Ministry of Agriculture and Marketing.

The study includes general reference to the relationship of nonformal education to integrated rural development and more specifically extension education in agriculture. This is done to provide a frame of reference for professional educators and other development practitioners whose fields are not in agriculture. It also cites descriptive literature about farming systems research as a development strategy for agriculture, emphasizing its extension education component. It then investigates the impacts of FSR extension education programmes in Lesotho on three audiences over a five year period in terms of perceived changes in knowledge, attitudes, skills, aspirations, practice, and end results or real benefits; and it seeks to determine the extent to which farmer contact groups are themselves disseminators of innovative agricultural information.

The study does not evaluate FSR as a strategy in any other aspect besides its extension education impact nor in any other country besides Lesotho. The extension education activities during 1985 and 1986 may be briefly described or forecast merely to bring totality to the Lesotho FSR intervention and do not form part of the data base for this impact assessment.

As a major integrated, farmer-oriented research strategy for addressing the basic agricultural needs of the rural poor in Lesotho, the Farming Systems Research Project has been active in three agroclimatic prototype areas since 1979 in a seven-year continuous intervention. Intensive extension education programmes in agriculture, contemplated in the FSR project rasionale, have been conducted during four years among farmer contact groups. Prototype area chiefs and village headmen/women have received extension instruction in agricultural development during two consecutive years. Continuing education programmes in extension methods and agriculture for district-based extension workers and subject matter specialist have been carried out over a four-year period*.

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* These education programmes for ministry personnel were not limited to prototype areas, but were conducted nationwide.

No matter how philosophically and operationally attractive the FSR strategy seems to be in the minds of practitioners, its efforts are essentially wasted unless the outcomes can be measured in terms of behavioural change among members of target clienteles. Since FSR in Lesotho conducted its extension education endeavour on the three fronts mentioned above the three clienteles are evaluated separately. However, it is expected, over time, that mutually strengthening relationships may develop among those clienteles whose ultimate aims overlap substantially. Such relationships require time, and current investigation into the extent of their existence is not attempted within the scope of this study.

1.5 THE PURPOSE OF THE STUDY

In order to determine the impacts such extension education programmes have had in the farming systems research context in Lesotho on the three major clienteles involved, the purpose of this study is:

- to inquire into the relationship of extension education to the farming systems research strategy.

- to analyze the impact of farming systems research extension education programmes on members of farmer contact groups in three Lesotho prototype areas, as perceived by members.

- to determine the momentum of farming systems research farmer contact groups as disseminators of innovative agricultural information in Lesotho prototype areas.

- to document the effect of extension education programmes on prototype area Basotho chiefs and village headmen/women, as appraised by same.

- to determine the impact of farming systems research continuing extension education programmes on district-based agricultural extension workers and subject matter specialists in Lesotho, as reported by participants nationwide.

- to discover other findings of relevance to the development and improvement of future farming systems research and extension education programmes.

Extension education programmes for members of farmer contact groups and for chiefs and headpersons, evaluated in Chapters 3 and 4, were conducted only in the three agroclimatic prototype areas. Programmes conducted for ministry personnel were carried out nationwide.

1.6 METHODS OF INVESTIGATION

The decision to evaluate and analyze the impacts of FSR extension education programmes in Lesotho was reached during the fifth year of the Farming Systems Research Project's life and during the third of the principal researcher's tenure in the country. Earlier concentration of the principal researcher's time and expertise was focused on the extension education programmes themselves and on such ancillary activities as planning information services, institution-building, radio diffusion, and reporting. The study thus becomes one of retrospective investigation. As a result, it is necessary to review literature illuminating the evolution of nonformal education in the context of rural development and extension education in agricultural development. More importantly, it is critical to select an evaluative/investigative technique which is retrospective in nature, given that so few evaluative parameters were established at the outset of the FSR extension education programmes. Finally, analytical techniques are chosen on their appropriateness for the determinations to be made, and consistent with the strength and structure of the data collected.

1.6.1 The literature review

A fundamental function of the literature review is to study evaluative, investigative and analytical methodologies in order to select appropriate means for determining the impacts of the extension education programmes being studied. It explores the philosophy and conceptual framework of the farming systems research (FSR) strategy for agricultural development, and extension's role in that context. It provides the foundation for an examination of more primary documentation about FSR in Lesotho. This latter, largely descriptive, brings the study to its local scenario and elucidates those extension educational experiences which are to be evaluated and analysed in Chapters 3, 4 and 5.

1.6.2 The evaluative/investigative model

The evaluative/investigative model chosen for the study is the Reflective Appraisal of Programmes (RAP), an approach to studying clientele-perceived results of extension programmes (Bennet, 1982). The choice follows examination of a number of methodologies according to their appropriateness for the task involved.

Campbell and Stanley (1966, pp. 6 - 66) describe a number of experimental and quasi-experimental designs for research that suggest some applicability to the conditions which obtain in the present study. What they term the one shot case study is structurally useful in the case of evaluating FSR education programmes. The authors, however, dismiss the case study as scientifically unsound since both pretest and control factors are absent from the formula. Bennett (1982, p.4.) in effect disagrees, as his methodology, subsequently discussed, assigns important evaluative and investigative value to reflective appraisal of extension education programmes by clients. The static-group comparison described by Campbell and Stanley includes the basic treatment and observation relationship but calls for a control group. Other designs described by the same authors which contain useful constructs but require other components such as pretest, control or other comparative groups include the Solomon four-group, posttest-only control group, the separate-sample pretest-posttest, the separate-sample posttest control group and the recurrent institutional cycle design. Campbell and Stanley do lend some credibility to what they call the retrospective pretest by describing cases of posttest interviews among compared groups in which no significant differences were found in prior attitudes, or presumably in prior knowledge or practices. That conclusion would seem to complement the notion of the strength of reflective appraisal of programmes (RAP).

Fox (1969, pp. 423 - 434) provides valuable guidelines to several components of the current research problem. He discusses elements of the descriptive survey, the retrospective survey and the evaluative survey. Aspects of all of these are useful. Although the information produced by a purely descriptive exercise would not be sufficient to satisfy the elements of the purpose of study, the descriptive component is an important phase of the research. Certain principles of the retrospective survey are useful only insofar as a general precondition to the FSR extension education programmes to be evaluated can be indirectly generated. The evaluative survey elements are also useful inasmuch as evaluation of change over time is the essence of the current exercise. The single criterion in the Lesotho case is the tentative impact of the extension education programmes in question, a model for which Fox does not clearly supply. Also, the precondition question would seem to elude Fox's description of the evaluative survey technique.

In a classic volume on cooperative extension work, Kelsey and Hearne (1949, pp.219 - 220) point out the vital purposes and importance of evaluation of extension education programmes and stress evidence of changed behaviour as the central measure of such evaluation. They likewise provide helpful hints on the evaluation process with respect to measurement, sampling procedures and summarization of data. Leedy (1974, p.79) is particularly enlightening on processes quite appropriate to the research task at hand in his treatment of the descriptive survey method in which his discussion of questionnaires, interviews, sampling and interpretation of data is relevant. The singular constraint to the Leedy approach is its rather broad application to the social sciences with little direct reference to extension education programmes in agriculture.

The evaluative/investigative technique known as reflective appraisal of programmes (RAP) (Bennett, 1982) has been selected as that most suitable for the research task at hand and is the technique followed during the rest of the study, with maximum freedom allowed during the analytical phase. RAP is an approach to studying clientele-perceived results of extension education programmes which was developed in collaboration with a number of American practitioners as a logical methodology emanating from earlier extension programme evaluation work (Bennett, 1976, and 1980). The methodology is designed to determine the changes which extension programme participants perceive to have occurred subsequent to and as a result of their participation. It does that by collecting systematic reflective evidence from participants by means of standardized questionnaires and interviews and then analyzing such data to determine its significance (Bennett, 1982, pp. 1 - 9). It contemplates selecting programmes for study, setting level(s) of evidence to be evaluated (Bennett, 1976 and 1980), developing appropriate questionnaire/interview instruments, gathering data, analyzing data and making conclusions and recommendations.

The development of RAP grew out of a need for practitioners themselves to be able to research the results of extension education programmes in order to determine trends and recommend improvements. The major feature of RAP which makes it particularly useful for research by practitioners is its simplicity. It employs a step by step model for studying extension education programmes. In the words of its author and principal proponent, "specifically, RAP is a standardized application of a level-of-evidence model (Bennett, 1980) for evaluating the results of extension programmes (Bennett, 1976)".

Further, the methodology is as appropriate to human development programmes as it is to those in agricultural innovation. It can be carried out by the practitioner and his colleagues on the job and becomes part of and not divorced from, on-going programme activities. RAP is a state of the art methodology approved by the U S Department of Agriculture for the study of cooperative extension programmes by practitioners.

There are arguments for and against the validity of reflective evidence in the appraisal of extension education programmes. Objectivists hold that what clients perceive or believe about an education programme in which they have participated is what they want to believe in order to make themselves look good before the investigator. Objectivists also suggest that memory loss and distortion invalidate reflective evidence, and insist on physical sciences models for impact studies. Subjectivists, Bennett (1982, p. 6) among them, counter that human education *is* perception and that meaningfulness depends on perceptiveness. These subjectivists further hold that perception permits respondents to interconnect and make cumulative sense of programmes which transcend both time and methodology, that perceptual data is highly descriptive and that reflective evidence can be gathered after programme participation by clients only. This latter characteristic obviates the need for base data before programmes or for control group data. Follow-up questions, both open and closed-end, and verification of data activities can detect widespread distortion of fact. Last, subjective collection of reflective evidence of programme impacts may still be analyzed rather rigorously for meaningful and significant relationships. The principal researcher joins Bennett in his commitment to the subjectivist approach, and it is with the RAP methodology that this study proceeds.

Measures must be taken to reduce constraints to RAP. The bias which could arise from the vested interests of the principal researcher is offset by having ample critique and review of the data collection instruments by qualified researchers and by sharing the interview task with other colleagues to achieve balance. Two additional RAP constraints are commonly voiced by critics. They hold that RAP's standardized questioning procedure tends to produce responses which are too vague, and that reflective evidence tends to document feelings toward extension personnel rather than results of programmes. The principal researcher is convinced that effective follow-up questioning essentially reduces such constraints. Questions can include open-end probes, closed-end probes and actual observed verification of data. It thus becomes untenable for respondents to render unduly high or inaccurate scores and yet avoid the check system of providing detailed follow-up descriptions, which may be subject to further verification. A final argument by critics suggests that respondents forget programmes and the effects of programmes. As this constraint, like others before, has an element of truth, efforts are made to investigate clearly identifiable programmmes, over a reasonably short time period, refreshed by a concisely stated description of the programme contained in the data collection instrument. After all constraints have been addressed, it is still felt that the RAP approach toward the investigation of the impacts of extension education programmes in this instance is suitable.

1.6.3 Questionnaires

The questionnaire format used in the current investigation is the standardized but modifiable model which is part of the RAP investigative "package" (Bennett 1982, pp. 9 - 14). That choice has not been made without enlightening inputs and helpful pointers from other researchers and authors. Yang (1955, pp. 51 - 53), for example, argues that the questionnaire is a quick and easy method for gathering data among beneficiaries of programmes but advises and cautions on a number of critical points. He states that questionnaires must be of limited scope and length, questions must be specific and clear, and that superfluous words and unnecessary questions should be avoided. Yang further explains the appropriateness of the closed and open forms of questionnaires. His comments on advantages and limitations of questionnaires tend to be directed toward the mailed instrument and are not appropriate to this exercise.

Fox (1969, pp. 525 - 526) elaborates on questioning as a data collection method appropriate to the social sciences since answers to important questions must come from people, and questioning is a highly interactive method of compiling those answers. He is a proponent of its usefulness in descriptive, retrospective and evaluative surveys as he argues the logic of getting answers by asking questions. He feels questioning is really the only practical method for data collection in retrospective research. Fox then explores all the elements of the questioning method which he enumerates as (1) context, (2) content, (3) question, (4) provision for answering, (5) recording of answers, and (6) the nature of the research-respondent relationship. Fox continues his writings with a highly intellectual treatment of the concepts and theory underlying the questioning method.

Bennett (1982, pp. 9 - 14) brings the matter back into focus as he provides step by step instructions for preparing the interview instrument (questionnaire) which becomes the standardized but modifiable model for the RAP methodology. His questionnaire includes the selection of evidence levels to be studied, a description of the programmes, the use of closed-end items and probe questions, validation and people involvement, determining reactions, documenting KASA* change, practice change, and the end results of extension education programmes.

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* KASA is an acronym meaning knowledge, attitudes, skills and aspirations.

1.6.4 Interviews

It is important to note that the RAP questionnaire (Bennett, 1982, p. 9) is an interview questionnaire. It is a standardized but modifiable data collection instrument to be used as part of a personal, face-to-face interview with the respondent. In his instructions for interviewing programme participants, Bennett adheres to accepted interviewing principles. He guards against vested-interest bias of the principal researcher, gives guidance to the training of interviewers and explores interpersonal techniques for interviewing. These aspects of the current study in a Lesotho setting are discussed in Chapters 3,4 and 5.

Bennett seems to be on sound ground in his suggested interviewing techniques, but extreme care is required in order to heed the admonishments of Yang (1955, pp. 41 - 42) and Fox (1969, p. 538). Yang warns about suspicion towards outsiders, the tendency toward distortion by respondents and the temptation toward digression. Fox is concerned about the sensitivities of the researcher-respondent relationship which can be influenced by such factors as skin-colour, language, sex and quality and style of dress. How the principal researcher has dealt with cross-cultural sensitivity issues in adapting RAP to Lesotho conditions is explained in Chapters 3,4 and 5.

1.6.5 Verification of data

In implementing RAP in the Lesotho setting, Yang's (1955, p. 41) warning about distortion is not taken lightly. It can readily be seen that Lesotho national farmers might resist disclosure of fact, Basotho chiefs might wish to impress, and national agricultural professionals might wish to befriend the researcher and his colleagues. Measures taken to reduce the unavoidable constraints to RAP have been mentioned earlier and are more fully treated in subsequent chapters*.

Notwithstanding, it is felt that any perceived tendency toward exaggeration of reponses will be general, uniform and relative. Open-end probes should return the responsibility for truthfulness directly to the respondent even before he finishes with the interview. Perceived gross exaggeration or contrived fable can be checked by direct observation or cross-checking with superiors. Implementation of such verification measures hinges on the trained perceptions of the principal researcher.

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* It is anticipated that responses by African farmers may be unduly high, indicating overly optimistic levels of perceived change. Thus, careful analysis is warranted.

1.6.6 Analysis of data

Bennett has many suggestions he feels are consistent with his evolutionary development of the RAP model. Yang has his style for presentation of findings which is both simple and relevant to rural people in the developing world. Leedy has written a whole guide book for social science research and Fox's monumental volume deals with every aspect of the research process in education. The choices range from simple descriptive and illustrative presentation of findings by such constructs as bar charts, line graphs, pie charts and tables to a wide variety of statistical analyses. The exercise may or may not involve computer technology since the nature of the task to be accomplished will condition that decision. Assurances are in order that materials, expertise, counsel, software, hardware and intellectual capacity are available to the researcher, regardless of choice of methodology. Detailed descriptions of analytical techniques are found in Chapters 3, 4 and 5.

Since it has already been established that data produced by the RAP methodology are reflective, perceptive and at best subjective, findings may be expected to be tentative. They should, nonetheless provide valuable indicators of learning, adoption and benefits. Care, however, is required in interpreting such data.

1.7 EXPLANATION OF TERMS

Cooperative extension:

The nonformal education programme of the American land grant university system in cooperation with the US Department of Agriculture and American counties. The largest nonformal education system in the world.

Extension:

Or extension education; nonformal education, usually in agriculture and rural life, associated with land grant universities in America, but with ministries of agriculture and others concerned with nonformal education in numerous other countries.

Farmer contact groups:

Groups of farmers organized for the promotion of an activity, mainly extension education and agricultural or rural development.

Farming system:

The whole complex of activities that a farming household engages in to sustain their livelihood, including off-farm sources of income.

Farming systems research:

A development strategy in which scientists engage farmers in joint on-farm research and extension in order to solve problems as perceived and identified by the latter.

Land grant university:

One of a group of US universities created by the Morrill Act of 1862 to teach agriculture and related subjects. Agricultural research and extension were added to the land grant university mandate by subsequent legislation.

Objectivists:

A research community which holds that only objective, empirical and scientifically obtained evidence is useful in the investigation of research problems.

Pitso:

Traditional public assembly in Lesotho convened by chief to exchange information.

Prototype area:

In the context of this study, an agroclimatic area designated for the development of viable agricultural enterprises through farming systems research.

Reflective appraisal of programmes (RAP):

A methodology for the study of clientele-perceived results of cooperative extension education programmes, developed by Claude Bennett of the United States Department of Agriculture in collaboration with land grant university colleagues.

Subjectivists:

A research community which admits reflective, affective and perceptive evidence as valid in the investigation of research problems in the social sciences.

United States Agency for International Development (USAID):

A US government agency in charge of the implementation and monitoring of American foreign technical assistance programmes.

United States Department of Agriculture (USDA):

The American government department in charge of agricultural policy and development, including the cooperative extension programmes.

1.8 ABBREVIATIONS

AIS:

Agricultural Information Services (of the Lesotho Ministry of Agriculture).

ARDRI:

The Agricultural and Rural Development Research Institute at University of Fort Hare, Ciskei.

CIMMYT:

The Centro Internacional de Mejoramiento de Maiz y Trigo in El Batan, Mexico (also in Swaziland).

FSAR:

Farming Systems Approach to Research.

FSR/E:

Farming Systems Research and Extension.

FTC:

Farmers' Training Centre.

FMA:

Farm Management Assistant.

IRRI:

The International Rice Research Institute in Los Banos, Philippines.

KASA:

An acronym used in Claude Bennett's extension education evaluation models signifying measurable change in knowledge, attitudes, skills and aspirations.

LAC:

Lesotho Agriculture College.

OfR/FSP:

On-farm research with a farming systems perspective.

PCV:

Peace Corps Volunteer.

REA:

Research extension assistant.

RD:

Research Division (of the Lesotho Ministry of Agriculture).

WSU:

Washington State University.

CHAPTER 2 FARMING SYSTEMS RESEARCH AND EXTENSION EDUCATION: OVERVIEW AND THE LESOTHO EXPERIENCE

2.1 FARMING SYSTEMS RESEARCH

Shaner, Philipp and Schmehl (1982, p. 13) define farming systems research and development (FSR & D) as "an approach to agricultural research and development that views the whole farm as a system (and) focuses on (1) the inter-dependencies between the components under the control of members of the farm household and (2) how these components interact with the physical, biological, and socio-economic factors not under the household's control".

Hildebrand and Waugh (1983, pp. 4, 5) seem to feel that the above definition is too vast for practical management. They concur with Norman (1982, p. 1) who broke the farming systems approach into the dual components of (1) the farming systems approach to infrastructural support and policy (FSIP) and (2) the farming systems research and extension approach to technology generation, evaluation and delivery. It is this latter concept with which the current study is concerned*.

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* In Lesotho, FSR/E is carried on intensively in three agroclimatic prototype areas representing that country's lowlands, foothills and mountain environmental zones, although consisting in a very small part of the total land surface. Molumong has seven villages, Nyakosoba ten, and Siloe eleven.

Hildebrand and Waugh have simplified its working definition in these terms: "FSR/E is applied, farmer oriented, agro-biological research, supported by the socio-economic sciences in a team effort which includes extension responsibilities. The principal product is technology. The primary clients are farmers". They outline the procedural steps of FSR/E as, roughly (1) area survey and problem identification, (2) design of first-phase research and continuing survey, (3) generation and screening of technologies through experimentation, (4) analysis of data, (5) extension of acceptable results where appropriate. Hildebrand and Waugh think that FSR/E brings science and other expertise into a problem-solving mode through multidisciplinary teams of practitioners working closely with farmers.

Farming systems research procedural steps may be described in slightly different language. The critical components are (1) target and research area selection, (2) problem identification and development of a research base, (3) planning on-farm research, (4) on-farm research and analysis, and (5) extension of results (Shaner, Philipp and Schmehl, 1982, p. 27).

Watts and Claar, (1983, pp. 10 - 11), view farming systems research, as currently supported by USAID, as a major conceptual breakthrough in farmer-oriented agricultural research. Nobe (1983, p. 24) sees FSR as a prototype managerial organization for agricultural development, as opposed to patronistic and administrative types; and thinks the specified results feedback mechanism is a major strength of the FSR approach.

FSR as a viable strategy for research in developing agriculture in South Africa is introduced by Van Rooyen (1984, p. 56 - 63). He singles out the farmer as the central figure in applied farming systems and thus a vital partner in farming systems research. He stresses its complementarity to traditional research but feels FSR can best take into stride the abilities and attitudes of farmers. Van Rooyen describes the essential steps of FSR as (1) description, (2) design, (3) test, and (4) extension; and feels that the interaction of forward and backward linkages between researchers and farmers is its great strength. By studying farm conditions in uniform environmental and socio-economic areas, FSR is able to develop recommendations which are applicable throughout such "domains". Another strength of FSR, according to van Rooyen, is its reliance on multidisciplinary teams in the study of farm systems and in subsequent on-farm research and extension. He feels that, in this way, relevant human and social variables are linked to all steps of the agricultural research process. He summarizes by making a strong claim on FSR as a sensible approach to the small farmer needs of Southern Africa.

Kirby, Gallegos and Cornick (1981, pp. 3, 29) describe Cornell University's experience in Ecuador. They deduce that improvements in rural communities happen only through thorough understanding of the farming systems in place, and that multidisciplinary teams, including extension personnel, can best bring about that understanding. Beyond such desired understanding, the multidisciplinary teams can help identify problems, identify constraints, and evaluate through on-farm experimentation alternative farming practices.

These authors are convinced that the likelihood of adoption of agricultural innovations is enhanced by this kind of commitment to comprehension of the reality of the conditions facing farmers. The relationships developed between farmers and professional personnel are seen to be valuable in sharing the responsibility for agricultural research.

The consultative group on international agricultural research (CGIAR) is applauded by van Rooyen (1984, pp. 236 - 237) for general adoption of farming systems research in their quest for new technologies adapted to small farm conditions. He thinks FSR links farm problems to research activities and thus enhances the likelihood of adoption of innovations. Van Rooyen distinguishes between simply studying the farming system and the more problem oriented on-farm research with a farming systems perspective (OFR/FSP), the approach espoused by CIMMYT *. Since CIMMYT is one of the CGIAR centres, their widely touted OFR/FSP approach has had a notable influence on other CGIAR organizations, particularly IRRI **. He encourages CGIAR to continue even more FSR networking among their other centres.

Expanding on the notion of "domains", earlier mentioned by van Rooyen, Harrington and Tripp (1984, pp. 24 - 25) identify recommendation domains as the framework for on-farm research. Since the objective of OFR is to produce recommendations for farmers, then such recommendations should be reliable over a recommendation domain consisting of farmers whose farms and practices are similar and who farm within a uniform agroclimatic zone***.

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* CIMMYT is the Centro Internacional de Mejoramiento de Maiz y Trigo, El Batan, Mexico (also in Swaziland).

** IRRI is the International Rice Research Institute, Los Banos, Philippines.

*** This was the rationale for the Lesotho Government's selection of the mountains, foothills and lowlands agroclimatic prototype areas of Molumong, Nyakosoba and Siloe.

Formulating recommendations for these domains (groups of farmers) will insure against the fielding of recommendations which are either too specific or too broad, thus strengthening their reliability throughout the domain. Harrington and Tripp emphasize that the recommendations which are eventually made for a given domain are the product of close field work with the members of that domain in on-farm trials, their analysis and their acceptance.

In further description of the nature and dynamics of farming systems research, Shaner, Philipp and Schmehl (1982, p. 4) say that FSR can be summarized as being "farmer based, problem solving, comprehensive, inter-disciplinary, complementary, iterative, dynamic and responsible to society".

FSR researchers keep farm conditions in mind and integrate cooperating farmers in on-going research into solvable problems. FSR team members from a variety of relevant disciplines work together in studying all components affecting farmers' lives and the interrelationship of these components. Such studies complement basic research and the findings of other concerned organizations. FSR researchers use their findings to update their understanding of the farming systems being studied and modify further study accordingly. Dynamics are important in FSR as small modifications may lead to subsequent major changes, being at all times responsible to both local farmer groups and society at large.

Hildebrand (1984, pp. 87 - 89) suggests that scientists who work on interdisciplinary farming systems research teams must have genuine interest in the disciplines of other team members and be willing to accept observations and suggestions from collaborators outside their respective disciplines. They need to be flexible and willing to modify field techniques to accommodate the interdisciplinary approach. Farmers too must be fully integrated into field research for the FSR spirit to fully prevail, and for the entire team to appreciate farmers' views on their own constraints. The farmer must be the prime client for FSR to make sense and for farm problems to be solved in a prompt and realistic way. While researchers look at problems in an academic way, Hildebrand warns, farmers are concerned with the urgency and survivability of their livelihood. He thinks FSR team members must feel this sense of urgency in solving farmers' problems in order to be credible among their principal clients. While FSR was developed on three continents under independent conditions, there is now general agreement as to its "essence" and its field methodology, according to Hildebrand. Surveys must be quick, relying a great deal on the cumulative knowledge and wisdom of farmers. FSR researchers must work with available resources and not waste time on wishful thinking.

Three experimental approaches to agricultural improvement in southern Mali are examined by Kleene (1984, pp. 131 - 138). He describes agronomic tests as a tool extensively used in thematic and agronomic research in development projects. He looks at full-scale demonstrations used as a vehicle for the introduction of technical "packages". Finally, he explores farm counselling, as a spin-off from farming systems research, as a way to help farmers assess their own situations and resources and make decisions about farming strategies. Kleene decides that farm counselling is the best opportunity for teamwork among farmers, researchers, and extension workers toward adoption of viable farming practices. He warns, however, that farmers' skills are fundamental to real FSR partnership and that more emphasis must be placed on farmer education.

There are some problems in the implementation of agricultural research projects with a farming systems perspective, according to Norman (1983, pp. 2 - 11). Norman chooses to label his strategy as the farming systems approach to research (FSAR) and says that problems arise during all phases of such projects. There are usually three parties to an FSAR venture, he says. They are (1) national government agencies such as research or extension, (2) donor contracting agencies such as USAID, and (3) the members of the research/extension team such as the Kansas State University team in Botswana. The first problem encountered may be the inadequate understanding of farming systems research and what is expected from each of the parties involved. Norman feels that the project design phase should provide a forum for reducing this difficulty. FSAR requires operational linkages among national agencies such as research, extension, and planning. At times there are inadequate such linkages and FSAR is too often not perceived to be complementary to such agencies' normal operations. A steering committee of persons representing the various national agencies is suggested by Norman as a group which can work out interagency constraints and cooperation. There is also a constraint inherent in inadequate understanding of FSAR by donor and contracting agency administration which may be seen in their inability to recruit appropriate personnel for field research teams. Contracting agencies, often universities, may experience problems in rewarding faculty members in consistent, sensible ways for overseas FSAR work. Team members, especially researchers, may have to retrain in order to cope with the conditions of farming systems research. In the initial project implementation stage, Norman identifies the maze of administrative and support systems to be a major constraint of the same general magnitude as ensuring the relevant linkages among national programmes and getting the FSAR team started. In the latter sense there may be problems with personalities, frustrations, and the "weaning" of team members away from academic security mechanisms. Contingencies of the continued implementation of an FSAR movement, Norman points out, are data collection methodology, data analysis, the production of convincing results, adoption rates by farmers, and the destruction of months of good work by vagaries such as hail, drought or unseasonable frosts. A final constraint to be carefully considered and its reduction conscientiously sought, according to Norman, is the harmonious working relationship between expatriate advisors and national counterparts.

Rose and Tapson (1984, pp. 166 - 177) adopt an FSR approach with respect to the problems of agriculture in developing countries and as an operational strategy for the University of Fort Hare's small-farm systems research activities in Ciskei. The authors recognize the frequent and frustrating fact of life for agricultural development workers which lies in the non-acceptance by farmers of innovations developed for their benefit. Much of the technology researched and recommended for small farmer use remains largely ignored, according to these authors. They liken the problem of non-adoptionin Africa to large parts of the rest of the Third World. Among the phenomena blamed for non-adoption are lack of inputs, lack of roads, poor markets, ineffective extension services, and insecure land tenure systems. Prescriptive agricultural development schemes in Africa have largely failed. Rose and Tapson support Kirby, Gallegos and Cormick (1981, p. 3) and espouse the Cornell University approach to agricultural research used in Ecuador. In so doing, they accept the premise that the most severe deterrent to peasant adoption of agricultural innovation is that so much of the technology developed is inappropriate to the conditions of the small farmer. Cornell, and by extension Rose and Tapson, promote an FSR concept involving (1) understanding farmers and their practices, (2) identification of farmers' problems and priorities, (3) isolation of constraints to productivity, and (4) selection through on-farm experimentation of improved practices most likely to be adopted. Based on these convictions, faculty members at the University of Fort Hare, through ARDRI*, have implemented small-farm systems research in Ciskei. They anticipate the improvement of small farmer conditions in the region, achievement of food self-sufficiency and respectful treatment of human and environmental concerns. The research design involves chiefs, cooperating farmers, and communities whose current farming systems are studied. Problems and needs are jointly identified. A second component involves a small-farm research centre at the University of Fort Hare to improve, under research control, practices identified on farms. A third component sees promising concepts, crops, and practices taken back to collaborating farmers for extensive field testing under (1) researcher control, and (2) farmer control. Research results surviving phases 1 and 2 above are then appropriately extended as recommendations over a wider domain. Failures are examined as to cause, and reasonable modifications sought. Rose and Tapson summarize by seeking to study current farming systems, their reasons for currency, their methodologies, their environmental areas, and their constraints. Improvements in systems and reduction of constraints become research objectives. Appropriate innovations are extended to farmers.

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Small-farm development in the emerging world requires a shift in research and extension thinking, according to Harwood (1979, p. 118). He writes about those aspects of small-farm production systems which lead to efficiency under limited resource conditions. A mix of traditional and more advanced technologies is usually called for in breaking the productivity barrier. Harwood proposes collaborative work among researchers, extension workers, and farmers in this respect.

Jones (1978, pp. 21 - 25) argues that the quality of leadership in agricultural research has traditionally been insensitive and researchers themselves indifferent to the needs of primitive food producers. He suggests that an FSR approach can lead to improvement in these conditions by encouraging people to define clear objectives and priorities. This can also lead to new research and extension models, Jones states.

The methodology of a farming systems project in Central America, is described by Lagemann (1981, pp. 2 - 30). The FSR approach is employed to characterize farms, develop and screen new technologies, and to diffuse such innovations through national extension organizations. FSR has as its central goal the improvement of farm production and productivity, through the introduction of innovations, according to Lagemann.

Dixon (1979, pp. 442 - 448) describes a farming systems research project in Ethiopia based on the consideration of farmers' perceptions, testing recommended technology in the farm environment and the extension process. Close cooperation between farmers and extension personnel is reported. However, close and timely supervision is urged by Dixon in such areas as planting and fertilizer application. Special attention must be paid to special considerations like weed control, oxen tillage, and threshing, he adds.

Bembridge (1982, p. 97) laments that agriculture, which provides food for only a third of current populations, is the weakest link in the development of South Africa's homelands. Actual food production is in a state of decline. Neither physical nor rural development emphases have addressed agricultural productivity. He proposes a farming systems approach to the study of the systems in place, the nature of the households involved, and the constraints to productivity. Bembridge suggests a strategy of advancing the growth potential of progressive farmers and, at the same time, offering recommended innovations to farmers participating in a later stage of agricultural development.

Adoption of new technology in emerging agricultural countries remains lower than expected, according to Ecklund (1983, pp. 141 - 153). He links the failure to attain expected returns more with how agricultural research is conducted than with price structure or inadequate agricultural support services. Ecklund argues for national agricultural research and extension services which emphasize on-farm research with a systems approach.

Winkelmann and Moscardi (1981, p. 35) examine the explanations for the failure of farmers in developing countries to follow the recommendations made to them by researchers and extension workers. Traditionalism among farmers is often pointed up as a major constraint. Others place the blame at the door of extension services thought to be inadequate. Faulty structures responsible for credit, inputs and market are also seen by some as constraints to acceptable adoption rates. Finally, it is suggested that recommended technologies are simply not appropriate for small farmers in the developing world. All these have been true at given times and places, say Winkelmann and Moscardi. However they demonstrate that adoption of certain recommendations and rejection of others happen among the poorest farmers who are subject to all the vagaries mentioned above. This leads the authors to take the charge of inappropriate technologies and recommendations seriously and ultimately conclude that careful aiming of agricultural research at the needs of farmers is urgently required.

Small farmers resist accepting change because of having inappropriate technology recommended for their adoption, writes Hildebrand (1981, p. 111 - 118). He does not believe the problem is one of motivation. Appropriate technologies constitute a challenge for researchers, according to Hildebrand, because agro-socio-economic conditions of small farmers are highly location specific. Small farmers do not react favourably to technologies developed for commercial farmers. He proposes that multidisciplinary teams live and work closely with farmers in order to jointly conduct research and develop problem solving technologies. Such research mode, on the part of the scientists, represents a departure in the work norm, Hildebrand admits.

It can be seen by the foregoing review that farming systems research has become a major contemporary development strategy throughout the emerging world. It is a strategy that reverses the direction of the more traditional basic-to-applied flow of agriculture and technology. Rather it engages the farmer as an active partner at the very outset in the identification of agricultural problems and concerns as seen through farmers' eyes and in the context of their "world". It then retains the farmer as a proactive "colleague" in on-farm research. He or she becomes one of a team of problem solvers who probe and test ideas and promising alternatives and technologies on farmers' fields. At any time in this process, the farmer may accept, reject or modify an idea based on constraints identified from the farmer's point of view. Importantly the farmer is meanwhile sharing the cost of intervention and change. The theory behind the strategy, among other things, holds that if farmers have an active role in sharing with researchers their rationale for doing things the way they do, in identifying their own problems as they see them, in trying alternative solutions and changes on their own land at certain costs and risks to themselves, the results of that exercise will have a much higher probability of widespread adoption than have the results of the more traditional "top-down" recommendations of common experiment station research. Farming systems research as a development strategy is not intended to replace experiment station research, but to complement it in a highly dynamic and realistic manner (Youmans, 1984, p.1).

With the establishment of farming systems research as the state-of-the-art approach to agricultural development, it is important to study the role of extension education in that context.

2.2 EXTENSION EDUCATION IN FARMING SYSTEMS RESEARCH

If farming systems research is to have an enduring developmental effect in the emerging world, extension education must play a central and continuing role in its implementation.

Watts and Claar (1983, pp. 10 - 12) recognize farming systems research and extension as a breakthrough in agricultural development strategy which addresses basic weaknesses in earlier development efforts. They see viable extension education equally as important as research if international agricultural assistance is to have a lasting impact. They applaud the recent expansion of the FSR acronym to FSR/E in recognition of the vital role of extension in the adoption of technology. The basic philosophy of farming systems research remains intact as extension is built in as an effective part of every stage and as an assurance of relevant technology application at the farm level. Thus, the research/extension linkage continues to be critical. Watts and Claar conclude that the FSR brand of adaptive research and national field extension services are complementary parts of a viable agricultural development system.

Agricultural research can suffer from its rigid adhesion to technical criteria in its need to relate to managerial criteria in the farming systems research mode (Collinson, 1984, pp. 1 - 11). Strong research/extension linkage can help. This author thinks that the oft-lamented linkage failure is overstated and that a more fundamental issue is for both research and extension to adopt a managerial methodology in the development of recommendations for small farmers. He points out many difficulties in truly and jointly achieving this farmer/managerial focus. He does, nonetheless, recognize that institutional and operational gaps are a problem in African governments' response to agricultural needs but believes that a merger of technical and managerial talents and the interfacing of researchers, extension workers, and farmers in the field can improve the linkage question. Collinson calls on extension at the senior officer level to monitor on-farm research with a farming systems perspective (OFR/FSP) in order to have an extension input into the experimental, recommendation, and managerial phase of the process. Extension field workers also have a role, he submits, in assisting the OFR/FSP teams in organizing farmer meetings, farm visits, interpretation, cooperating farmer identification and selection, laying out experiments, and results assessment. In this way, extension field workers are fully integrated into the farming systems research process and thus become more effective educators during the diffusion stage.

Rose and Tapson (1984, pp. 176) see personnel from the extension branch of the Department of Agriculture as members of a research management committee in their farming systems research work in the Ciskei.

Writing on the Indonesian cropping systems programme, McIntosh (1981, pp. 123 - 125, 137) suggests that research must include all components of the production system as well as address associated extension and marketing problems. He sees both scientists and extension workers active in site surveys and data collection for site selection and description. In preproduction testing and implementation stages of cropping systems research, McIntosh finds extension heavily involved on an increasing scale. This not only builds ties between research and extension, it provides the basis for continued monitoring of programmes by extension personnel.

A unique view of an extension role in peasant agriculture, is shared by Bernsten (1981, pp. 143 - 149) from his experiences with Harwood in China where "the major information that is being used as the basis for extension materials is not a product of 'research' per se at all. Most of it has come from sending scientists and other people down to the farm level (communes) to learn from farmers, analyze what they are actually doing, record it, understand it as best they can, draw out (where it is possible) the theory and reasons to understand it, and then publish the information in extension materials. These extension materials are very effective and well illustrated."

McDermott (1984, p. 3) displays the research/extension component tasks along a graphic continuum, and fears that the professions involved too often work in the poleward reaches of that continuum. This tends to leave a functional gap in the testing and adaptation range. McDermott views FSR as a strategy for completing the cycle of the technology innovation process without such fatal breaks. He calls for thorough integration of research and extension over as much of the continuum as possible with a very strong linkage point. The on-farm trial stage of the FSR formula is an ideal opportunity to strengthen this linkage. This is especially true in developing countries where there are no extension specialists to bridge the gap between research scientists and extension field workers, McDermott concludes.

Current programmes and the advantages of improved research/extension linkages in the institutionalization of farming systems research and extension in Botswana are addressed by Baker (1984, p. 5). He thinks the Botswana government realizes the need for integration of agricultural research, extension, and planning as well as the development of farmer centered policies and technologies which form the base for continuing extension programmes. That realization has led the government to adopt an FSR/E policy for agricultural development under which several donor project teams operate. Baker describes the various approaches taken by those projects to (1) make FSR results viable and useful to extension, and (2) to find better ways for extension field workers to assist FSR teams in their work.

Low (1984, pp. 3 - 5, 13 - 14) writes on farming systems research in Eastern and Southern Africa and sees some shortcomings in research's predisposition to communicate adequately with extension workers and small farmers. He thinks there is a top-down flow of agricultural information to the field and calls for a more developed feedback mechanism in order to communicate the acceptability to farmers of research results. Low urges appropriate extension messages which can derive from farming systems research, and calls for strengthened linkages as well as the development of farm recommendations from a managerial perspective. He thinks careful on-farm research can produce such recommendations.

The development of extension programmes for conservation cropping in Queensland, according to Chamala and Keith (1984, p. 9) follows Shaner's criteria in that it is farmer-based, problem solving, interdisciplinary, comprehensive, complementary, dynamic and responsible to the short and long term goals of society. They view extension as a parallel activity to research and development, planned from the same perspective and oriented toward the same goals. As such, extension contributes to the integrated development process at all stages.

Wijessoriya (1980, pp. 1 - 6) cites extension's role in the cropping systems pilot production programme in Sri Lanka as a partner in the development of a methodology to extend improved systems to farmers. The demonstration method is pointed out as an important tool of the extension worker that obtains better acceptance than simple instruction. Wijessoriya also believes the demonstration provides a learning as well as a teaching experience for extension workers and can effectively be used to communicate farming methods, results of farming practices and solutions to farm problems.

There are examples of agricultural development activities through which some countries are producing adequate food and are improving the productivity of land and people, states Waugh (1978, pp. 2 - 19). He points to new strategies where both scientists' and farmers' expectations are met. He urges strong linkages between research and extension in support of such systems but does not feel that research and extension must be structured together in order to function together. Waugh agrees with McDermott, however, in his contention that both must work together in effecting a continuum from technology generation to its incorporation by farmers. Such methods create a role in the field for "farmer extensionists", according to Waugh.

Easter and Hlope (1984, p. 16) credit the implementation of a structural reorganization of extension, the emphasis of subject matter specialists' role in agriculture, and the adaptation of the training and visit system of extension as real advances in a cropping systems research project in Swaziland. They view the linkage question as an objective of the project team. Hudgens (1984) describes the process followed in Zambia to introduce a farming systems perspective into the extension branch of government and to teach extension workers to fit recommendations to socio-economic and agroclimatic realities of their work sites.

The Francophone FSR approach differs from that sustained largely by U S universities, says Fresco (1984, p. 20). She describes the Francophone model as a large scale effort directed at the long term development of a region linked with extension and input supply. In contrast, the American FSR model focuses on adapting research results to small farmer needs within prevailing constraints.

Winkelmann (1976) decribes the internal dynamics of Mexico's famed Plan Puebla. The objectives of the project are the development of a profitable technology for maize production and a system for diffusing it. The methodology in the field includes on-farm experimental work, use of farmer contact groups in dissemination of information, provision of credit, supply of inputs, repayment of loans and the evaluation of outcomes.

Administrative structures coordinate the roles of research, suppliers of inputs, providers of credit, extension, and farmers. Extension workers from other parts of Mexico are trained in these methodological components. Plan Puebla has been able to demonstrate increase and declines in extension activities corresponding to the extent of regulatory and other tasks assigned to extension workers. Winkelmann puzzles through early years' outcomes of Plan Puebla and explains how extension is helpful in discovering why farmers do not respond according to assumptions of predicted behaviour. While he continues to support a strong extension profile in methodologies like Plan Puebla, Winkelmann warns about making recommendations all inclusive and too rigid in their implementation. He concludes that farmers are generally interested in profit but recommendations involving greater inputs, at greater risk, with promise of only marginally greater profits are generally avoided by small farmers.

The Nile Valley Project is a model for cooperation between international and national programmes in research and extension, write Hawtin et al (1984, p. 29). They point out as a highlight of the project the direct involvement of extension workers and farmers in on-farm trials. Since both

Egyptian and Sudanese nationals have performed the majority of research and extension work, the authors point out the cost-effectiveness of the project.

Johnson and Claar (1984, p. 36) hold that extension is vital to successful FSR programmes. There is strong and obvious interconnection between research and extension in such efforts, and it becomes extension's mandate to recognize the new opportunities created by the FSR methodology. To do this, extension must abandon shopworn methods and become a full partner in the shifting and dynamic technology diffusion continuum created by the FSR philosophy. Coevolutionary change in both research and extension are called for by Johnson and Claar.

The agricultural service network in the rice cultivation areas of Malaysia and Surinam, is examined by Kalshoven (1981, pp. 89 - 124) who finds an institutional approach at work in Surinam where extension offices are in place and the provision of farming inputs complements extension work. In Malaysia, inputs and credit are made available through farmers' associations. Kalshoven finds that extension field workers experience the same constraint as farmers in that resource scarcity inhibits their effectiveness as change agents.

Duval (1978, pp. 59 - 61) presents a model for the utilization of farmers' groups in South Africa in the development of a management information system and in reaching the greater community via programmed agricultural development. His is a hierarchichal model involving a central development committee, programme planning committees, and study groups. All include major roles and responsibilities for farmers, permitting maximum use of the extension agent's time as manager and educator. Progressive farmers are also linked with subject matter specialists in order to develop realistic parameters for agricultural development programmes.

Agricultural extension is the key to rural development in the present and former homelands of South Africa. Bembridge (1978, p. 252) describes the current situation of agricultural productivity in the homelands and lists population growth, fragmentation of land holdings, and deterioration of land resources as principal constraints. Former rehabilitation and capital intensive development schemes have largely failed, according to Bembridge, because of an inadequate knowledge of and respect for local socio-economic considerations. He calls for a multidisciplinary systems approach to agricultural problem solving in the homelands to include farmer-focused research, provision of credit and inputs, people-oriented extension methods, and reasonable marketing structure, in order to foster meaningful change in peasant agriculture.

The lack of communication between research and extension organizations in developing countries is not a serious constraint to technology transfer, but lack of integration is. Such lack of integration can frustrate the otherwise positive thrust of farming systems research, says Poey (1984, p. 56). Sometimes the validation process in FSR is interpreted as an invasion by research into the demonstration realm of extension. Poey suggests that obstacles can be removed and integration achieved if extension is involved in and shares ownership of the later stages of on-farm research and thus becomes totally familiar with resulting recommendations. These are then jointly promoted.

Youmans (1984, p. 1 - 5) warns that FSR is not a panacea. Farmers, in any areas, are by nature independent, suspicious and conservative. They take certain risks only if they are convinced of the wisdom behind the risk. He describes the trust bond between extension worker and farmer as a sensitive and carefully nourished relationship which rides precariously on the credibility of the former. The FSR practitioner must learn the principles of that axiom. Certainly, the FSR approach must be adapted again and again in cognizance of fluctuating economics, variability of the resource base, and differences among social and cultural systems. Agricultural economists are the first to agree that the "whole farm" focus can be grossly distorted by an anomaly in the farm management formula, such as massive migrant labour. Yet another notion which must become part of the working rationale of FSR researchers, according to Youmans, is that they cannot wait for "full information" on any aspect of FSR research before venturing recommendations. Full information is never at hand. Data are always forthcoming. In the meantime, farmers continue to farm, take risks, and to win or lose.

FSR researchers, in order to become credible among farmers, must take some risks as well, Youmans suggests. They must project themselves into the farmers' circumstances by hypothetically exchanging their annual salaries for one or two hectares of land in a developing country. Then, armed with the average access to resources they see around them, they should share with farmers the recommendations they themselves would follow in order to survive, improve, and provide for their families on that land! In that way, they will become more credible practitioners. Before any real gains can be made toward the challenge of widespread adoption of FSR recommendations, Youmans adds, practitioners must accept two basic notions. First, if an FSR project does not include a very strong extension component, then it is probably not truly FSR. Second, if extension is not essentially nonformal education, then it is not truly extension.

Most proponents generally agree that the FSR sequence must include the following major activities: (1) target and research area selection, (2) problem identification and development of a research base, (3) planning on-farm research, (4) on-farm research and analysis, and (5) extension of results (Shaner, Philipp and Schmehl, 1982, p. 27).

Youmans sees the selection of target groups and programme areas as essential to all extension programmes, thus well-known concepts in extension can be used to accomplish this FSR activity. Problem identification and the development of a research base can profit by the use of extension needs assessment and programme rationale techniques. Planning on-farm research is a process not dissimilar to demonstration programme development in extension. On-farm research and analysis, in the first instance, is closely associated with demonstration or trial work in extension. Analysis, in and of itself, may be the only component of FSR which falls wholly within the research domain. However, the extension of results is and remains the province of extension practitioners.

Given the preponderance of extension principles in farming systems research, Youmans thinks that extension practitioners must be party to the FSR process at all stages. Both the research community and major donor organizations must come to understand this. FSR ideally is a process through which farmers' needs and research capabilities become a common theatre of activity. This cannot happen without a third actor, namely extension. The maximization of desirable dynamics is best achieved by having extension personnel involved at every stage of the FSR formula. Evaluation should be cyclical, not linear. Modifications should be made when required, insuring the flexibility of the process. The shared efforts of research, extension, and the farming community can most certainly provide the critical ingredients for FSR endeavours everywhere, Youmans concludes.

A substantial basis for Youmans' assessment is provided by Shaner (1983, pp. 45 - 53). In his treatment of the linkage of extension with farming systems research, Shaner shows how farming systems research speaks to groups of farmers whose like conditions favour adoption of similar technologies. He sees FSR as a unique opportunity for building research/extension linkages. Shaner explains that FSR is farmer-based since there is considerable effort expended in learning about farmers' conditions through a variety of investigative methodologies. Knowledge of farm conditions is fundamental to the launching of a problem solving research programme in which minor initial changes can lead to more significant innovations over time. FSR is comprehensive in that it proceeds within the context of the whole farm structure. Normally, this requires an interdisciplinary approach to field research which should be complementary to former and/or more basic research, and to knowledge derived from other sources. Shaner prescribes that FSR is iterative and dynamic in that it is repetitive and self-adjusting. Early on-farm research provides knowledge and experience which can be used to modify further research. Finally FSR is and must be responsive and responsible to society in both its short term and long range consequences.

There is no stage of farming systems research in which extension should not be involved, according to Shaner. On the contrary, extension inputs are important to target and research area selection in view of extension knowledge of farmer and environmental conditions. Problem identification and the development of a research base are activities which make considerable use of extension expertise in both its familiarity with the area and in its methods for gathering information on situation and farmer clienteles. An added advantage is that of integrating extension into FSR while problems and opportunities for research are being articulated. Extension's knowledge of environment, organizations, input situation, markets and socio-cultural constraints is helpful to the planning of on-farm research. That research itself is often assisted by extension personnel thus augmenting the manpower available for the task. The diffusion of recommendations produced by the foregoing FSR process is the province of extension and is made more effective by its having been involved in all previous steps. Shaner, in depicting the extension involvement graphically, sees extension carrying sizeable responsibilities in site selection and problem identification and performing the major role in multi-locational testing and extending recommendations. He closes by saying that the FSR focus on understanding farmers in their environment, identifying farm problems, and designing and implementing on-farm trials together with farmers provides the ground for a central and critical extension input.

2.3 EXTENSION EDUCATIONAL PROGRAMMES IN FARMING SYSTEMS RESEARCH IN LESOTHO

Farming systems research has been a dynamic component of agricultural development in Lesotho since 1979, and extension plays a central role in that involvement. The Farming Systems Research Project is funded by USAID under Contract No. AID/afr-C-1517. The contractor is Washington State University, one of the institutions of the American land grant university system. The expatriate personnel attached to the project are faculty members of Washington State University, and national counterpart personnel are employees of the Lesotho Ministry of Agriculture and Marketing.

Lesotho is a small mountainous African kingdom, surrounded by the Republic of South Africa and its satellites, which occupies about 30350 square kilometres. This is approximately the size of the American state of Maryland. The United Nations lists the kingdom among the 25 least developed countries, largely because of its late start in development activity. Agriculture is the most important sector, economically and in terms of indigenous employment.

Mohair is the most valuable agricultural product. The population of Lesotho is roughly 1.2 million, of which nearly 200 000 work in the RSA, principally in the mines. Some five per cent of the home population resides in the urban centres while the great majority live in villages throughout the country. Some of the latter are remote. The country has roughly 900 000 acres of arable land, less than one acre per capita. Much of the remaining terrain is traditionally grazed. Elevation ranges between 1 400 metres and 3 500 metres. Periods of drought are broken by severe rains which contribute to critical soil erosion. Hail is common and accounts for frequent crop losses along with untimely frosts. Snow occurs routinely at higher elevations (Lesotho Farming Systems Research Project Paper, 1978, p. 1).

Agriculture in Lesotho is largely of a subsistence nature. Some 85 per cent of the population derives income from agricultural activites. If 56 percent of the labour force works in the country, fully 92 per cent of this percentage is employed in agriculture. Principal crops are maize, sorghum and wheat. Cash crops include beans, peas, and some wheat. Livestock are principally cattle, sheep, and goats. On-farm consumption accounts for 70 per cent of crop production. Animals and animal products make up 70 per cent of Lesotho's exports while crops, largely wheat, account for another six per cent. Lesotho produces roughly one-half of its food supply. Because of the country's communal land tenure system and the widespread incidence of migrant labour, uniformity of rural income is a unique phenomenon (Lesotho FSR Project Paper, 1978, p. 2).

Constraints to agricultural productivity thus include severe weather conditions, limited arable land, serious land erosion, and the intervening opportunity for mining labour. Shortage of draft power and non-productive traditional farming practices are also important. Inadequate use of fertilizer, low quality seed, poor tillage, lack of pest control, improper weeding, wasteful harvesting methods, and post-harvest losses all contribute to low productivity in crop production. Improper range management, overgrazing, lack of supplemental feeding, disease, and poor management affect both animal productivity and the quality of the resource base. It is some of these problems that farming systems research and extension seek to address*.

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* These underlying causes of low productivity formed the rationale for proactive extension education programmes among farmers, chiefs and extension workers in the context of FSR/E in Lesotho. Because of the interdisciplinary approach, problems were addressed simultaneously.

The FSR project in Lesotho has as its principal thrust the improvement of rural life by increasing the incomes of Basotho farmers. In doing this it works toward the creation of farming systems as rural enterprise mixes designed to improve farm productivity. Though largely directed toward on-farm research and institution building, emphasis includes finding the most appropriate means of transferring knowledge and gaining farmers' acceptance of recommended technology through extension*. The project is farmer-centered in that recommendations must be acceptable to farmers, sensitive to their management capability, appropriate to their resources, and protective of Lesotho's badly eroded land base (Lesotho Farming Systems Research Project Paper, 1978, p. 4).

While agriculture is the most important sector to the gross national product of Lesotho, farmers do not readily adopt innovative and potentially productive farming practices**. Keeping in mind the lessons learned about the "appropriateness" of recommendations, the FSR researchers and extension practitioners aim research toward the development of reasonable enterprise mixes, problem solving in the area of farming practices, and innovations which are feasible and affordable. This work is done together with cooperating farmers and members of village agricultural committees, with a goal of five per cent adoption by farmers in prototype areas by project end in 1986.

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* These were the general objectives of the FSR intervention.

** This is the principal problem underlying extension education programmes.

Inherent in FSR activity are on-farm research and adaptation of results to Lesotho farm conditions, building a national agricultural research capability within the Ministry of Agriculture and Marketing, and investigation into promising extension methodologies for transferring appropriate technologies and gaining farmers' acceptance thereof (Lee, 1985, p. 1).

Expatriate personnel deployed to Lesotho by Washington State University in advisory roles include administrators, farm management economists, a social analyst, agronomists, an animal scientist, marketing economists, range management specialists, a horticulturist, and a communications/information specialist (replaced by an extension educator since 1981).

Lee (1985, pp. 3 - 5) points out that farming systems research is fully integrated into agricultural research division activities. Agronomy and horticulture sections test new varieties of crops and seek cultural practices best suited to local conditions. Soil and plant protection units complement these activities with expertise and recommendations. Farm management personnel, cooperating with other sections, develop production enterprise schemes based on FSR principles. Marketing officers study market systems for livestock and crops and make recommendations to farming communities. Animal science and range sections work together toward sound but affordable animal management practices and recommendations protective of soil and natural vegetation resources. Lee explains that "the Extension Section holds farmer training sessions, schools for extension field personnel, interacts with Village Agricultural Committees, and prepares radio programmes and extension circulars on a year-round basis*. Field days are held in conjunction with the cropping season". While the work focus of the initially deployed FSR information/communications specialist is manifest in the extensive publication of research circulars and other on-going communications systems (Beckerman, 1981, pp. 1 - 14), the principal researcher, and current FSR extension specialist, operates under much wider terms of reference. Those terms of reference assume at least a Master's degree with academic preparation in extension, continuing adult education or community development. Previous experience in developing countries is called for, along with evidence of successful nonformal and extension education accomplishment (Bath, 1980, p. 2).

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* These and other activities above, are in fulfilment of FSR/E objectives.

The current extension effort within the context of farming systems research in Lesotho is expected to provide training and guidance to field extension staff in principles and methods of extension education to facilitate the transfer of research findings to village farmers*. It also must design, test, and monitor alternate methods for involvement of farmers in cooperative agricultural production and management, as well as alternate methods whereby communications can be improved among project staff, field extension staff, and farmers. In so doing, extension is to obtain evaluative feedback from farmers, field extension personnel, and others concerning new farming practices (Bath, 1980, p. 1).

Further, extension is called on to couch technical research findings and activities in language or other dissemination approaches that are compatible with farmers' literacy levels and cultural backgrounds. Coordination of technical information delivery to village households through extension staff and provision of feedback facilitation is part of the FSR extension role, and the conduct of continuing education for extension field workers, subject matter specialists and other local leadership is anticipated**.

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* A capability found to be deficient by the Lesotho Government prior to 1979.

** In order to strengthen deficiencies mentioned above.

Extension is likewise responsible for the documentation and in-house publication of research findings. Finally, the extension specialist himself is expected to demonstrate the potential of the advisory appointment as an extension research educator (Bath, 1980, p. 1 - 2).

Progress toward the above terms of reference, which carefully documents the nature of extension programmes within the context of farming systems research in Lesotho, is presented four years later (Youmans, 1984, pp. 1 - 10), as follows.

2.3.1 Extension education

Extension education in methodology, field techniques, farmer involvement, communication and programme evaluation is in fact the central thrust of Extension's work in Lesotho*.

2.3.2 Extension for improvement of farming systems

Thirty-one (31) area extension officers and research extension assistants from all areas were given 80 hours of instruction in extension methods and techniques and in technical subject matter at Mazenod during February 1982 at an "Extension for Improvement of Farming Systems" course. The course enjoyed the participation of research, extension and FSR.

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* This is in compliance with problem areas defined by the Government of Lesotho and contemplated in the scope of the Farming Systems Research Project.

2.3.3 Programme development education

Four (4) research extension colleagues received in-service education in the programme development process in April 1982. Emphasis was placed on the programme development cycle in extension and University of Nebraska slide-tape materials were used to assist the instruction.

2.3.4 Professional improvement in agricultural extension*

Thirty (30) district extension officers and subject matter specialists received intensive instruction in extension methods appropriate to developing agriculture for one week, followed by a second week of training in technical agriculture at the "Professional Improvement in Agricultural Extension" course at Airport in July 1982. Extension specifically developed lectures in extension philosophy, communication skills, and programme evaluation.

2.3.5 FSR training for REA's and PCV's

Eight (8) research extension assistants and Peace Corps volunteers were trained for one week at Maseru in September 1982. Items covered included orientation to the research division library, FSR enterprise combinations, agronomy, animal science, plant protection, soils lab, range management, horticulture, farm management, marketing, rural sociology, visit to Nyakosoba, and the role of the PCV vis-a-vis REA in prototype areas. Extension contributed significantly to the latter item.

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* Rationale for activities in 2.3.2 and 2.3.4 is explained fully in Chapter 5.

2.3.6 Direction of extension seminar

Extension provided conceptual information in connection with the "Seminar on Direction of Extension" held for ministry heads of divisions in October 1982. Information and impressions were supplied referent to centralization/decentralization, generalist/specialist extension work, and the strengths and weaknesses of the T and V system extension.

2.3.7 Farmer motivation seminar

Extension contributed expertise to both the planning and execution of a "Seminar on Farmer Motivation" held in October 1982 at the Research Division during which the special problems of farmer (and extension worker) motivation were studied by extension professionals of Extension and

Research Divisions.

2.3.8 REA/FMA training on coordination of work

Eight (8) research extension assistants and farm management assistants attended a training course at Maseru in July 1983. The theme for the course was coordination of field research and extension, training, enterprise combination testing, trials, livestock and range activities. Extension contributed to the organization, execution, instruction and documentation of the course.

2.3.9 Plant and soil subject matter specialists short course*

A short course was held for twenty-eight (28) of this important group of agricultural professionals in August 1983. Significant joint planning was involved in this course work with Research Division, Extension Division and Lesotho Agricultural College participating. A variety of faculty were also engaged. Extension participated in the design, implementation, instruction, ceremonials and documentation of this important course.

2.3.10 Peace Corps orientation

Extension organized the orientation of new Research Division

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* Rationale for activities mentioned in 2.3.9 and 2.3.11 is described fully in programme descriptions in Chapter 5.

Peace Corps Volunteers in August 1983. The PCV's included two persons for the Molumong prototype area, one for Nyakosoba and a Maseru-based agronomist. PCV's were exposed to programme information from a variety of research officers and expatriate specialists and to job expectations by extension and farm management personnel.

2.3.11 Extension schools ("The Extension Challenge")

After considerable reflection on the evaluative outcomes of earlier extension and subject matter specialist training, further field-based needs assessments confirmed the urgency for country-wide extension education in methods, techniques and delivery skills. FSR formed a travelling faculty comprised of administrative and extension personnel from Research Division and two officers from Agricultural Information Services. Extension Division personnel participated in curriculum development. The final curriculum contained instruction in (1) relation of research to extension, (2) needs assessment techniques, (3) group process and dynamics, (4) organization and maintenance of farmer contract groups, (5) communications skills, (6) extension teaching methods, (7) visual aids, (8) motivation and (9) evaluation. Ten extension schools were conducted in all districts of Lesotho. All district-based agricultural professionals, both extension and subject matter specialists, were encouraged to attend. During November through March 1984, two hundred and seventy-two (272) MOA workers attended the schools, clearly the most comprehensive continuing education programme in extension education in Lesotho's independent history.

2.3.12 Involvement of farmers in FSR

Comprehensive activities have been systematically executed in order to maximize farmers' familiarization with and participation in FSR dynamics.

a) Village agricultural committees (farmer contact groups)

The VAC has been the principal (but not exclusive) structure for the involvement of villagers and farmers in the conceptual, educational, practical and evolutionary aspects of FSR/E. Elected by villagers themselves on an annual basis, VAC committee members tend to be active persons who are engaged in farming and seen as leaders by peers*. Systematic VAC training was conducted. Molumong VAC members were trained in March 1982, February 1983, and February 1984 Nyakosoba VAC's were trained in April 1982, April 1983 and February 1984. Siloe VAC members attended training in May 1982 and May 1983. Collectively, one hundred and ninety-four (194) members received direct instruction by RD extension and technical officers. Instruction involved both FSR/E and technical agriculture.

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* If not fully representative themselves, VAC (farmer contact group) members are seen as those farmers most likely to influence others.

b) Shift from FTC's to FRC's for farmer training

Early VAC training was conducted at the farmers' training centers in Mokhotlong, Matela and Mohales' Hoek. The rationale was to utilize ministry facilities where food, lodging, classrooms and training capabilities were available for that purpose. However, numbers of trainees were constrained by size of facilities, preoccupation with happenings at home was always a distracting factor, training costs were comparatively high and logistics were complex. After the completion of the RD/FSR field research centers in the prototype areas, their use as "people's universities" was encouraged by the Minister of Agriculture. Considerable misgivings about the conduct of ambulatory or commuter training, non-provision of food, and attrition accompanied the shift of farmer training to the FRC's. The positive net result of two years' experience has been increased attendance, a willingness by farmers to invest in their own education, decreased cost to the ministry and simplification of educational logistics.

c) Education for village chiefs and headmen/women

It became evident that chiefs, headmen and headwomen were vital to the conduct of FSR/E in Lesotho. It was likewise evident that misgivings on the chiefs' part about FSR in the prototypes had their principal roots in lack of knowledge or communications breakdown. In January of 1983, it was decided to bring prototype chiefs, headmen and headwomen together at Matela FTC for training in FSR/E, the role of the chief in agricultural development, and technical agriculture. Short courses for this purpose were conducted in February 1983 and February 1984. Some thirty (30) local officials have benefited from this activity.

d) Cooperative education

Consistent with the Minister of Agriculture's directive that farmer contact groups take advantage of legislation favouring agricultural cooperatives, it was decided to provide education in the principles and dynamics of agricultural coops for the village agricultural committees in Molumong and Nyakosoba. The curriculum was standardized to meet the laws of the land by personnel of the Ministry of Cooperatives and Rural Development and trainers trained in that ministry. Thus, the appropriate personnel were engaged to cooperate with RD/FSR/E in the delivery of instruction and subsequent cooperative organization work which took place in Molumong and Nyakosoba in February 1984.

e) Nutrition education

Consistent with FSR/E work in home gardens, in collaboration with the Nutrition Section of Extension Division and as one more vehicle for farmer involvement, nutrition education was conducted in the prototype areas. Instruction on family nutrition as well as food preservation, storage and preparation was conducted. Short courses were given in Nyakosoba in January 1983 and in Siloe in February 1984. One hundred and forty-two women attended these courses.

2.3.13 Field communication

There is a continuous need to devise and improve upon systems through which maximum communication can be maintained among RD/FSR team members, field extension staff and farmers. Considerable success has been achieved in several ways.

a) Farmers field days

Farmers field days, (Nyakosoba, March and December 1983) (Siloe, November 1983 and January 1984) (Molumong, March 1984), have provided excellent opportunities for expatriates and research officers to share two-way communication with farmers, facilitated by the research extension assistants.

b) REA field programme supervision

Regular supervision of the REA's and PCV's field programmes was provided by extension research personnel. This contact and personal exchange provided another opportunity to maintain communications in the field. Despite the above, good communications at the field level continue to present a real challenge.

c) Radio communications

The installation of two-way radios in Maseru, Mokhotlong, Molumong, Siloe and Nyakosoba, is expected to improve field communications significantly.

2.3.14 Evaluative feedback

There is a constant need for evaluative feedback from farmers, field extension staff and others respecting development of farming systems activities. This was accomplished in a variety of ways.

a) Evaluation of educational activities

In all farmer education activities, such as VAC and chiefs training, both written and verbal evaluative feedback were gleaned. In each and every event, participant responses were programmed into the activities. Likewise, REA's were in constant contact with VAC's at regular meetings and relayed farmer feedback to RD/FSR. Improvements in this operational aspect are, nonetheless, to be sought.

b) Farmers as instructors

The most dynamic feedback technique used was the engagement of cooperating farmers as principal teachers during farmers field days, and at VAC short courses. The manner in which farmers grasped, executed and were able to share and demonstrate FSR activities and outcomes with others was dramatic. More of that is certainly desirable.

2.3.15 Dissemination of research findings to farmers

Dissemination of research findings to both villagers and farmers was amply absorbed into the farmer education strategies described above. There is one major indirect technique used which has not been explained.

a) Radio programmes

Extension Research conducted a systematic farmer education programme by radio, in Sesotho, on relevant research-generated topics and in the vernacular of the rural community. This activity was performed in collaboration with Agricultural Information Services and Radio Lesotho, but all programmes were prepared and voiced by Extension Research. From 1982-84 ninety-nine (99) radio programmes were aired. Extension Research attempted to assist and improve AIS's farmer education effort in Sesotho.

2.3.16 Coordination of research information delivery

There are two major activities not previously mentioned which were important in the coordination and delivery of research information:

a) Research Division field days

These field days were vital in the coordination and delivery of research information to the professional agricultural community. Extension was instrumental in the organization and conduct of these field days. Field days at the Maseru, Teyateyaneng and Leribe experiment stations were held in February 1982, November 1982, January 1983, May 1983, June 1983, December 1983, January 1984 and February 1984. Some 432 persons attended those field days.

b) Pitsos

Three information pitsos were held in connection with the dedication of the field research centres. All were attended by important functionaries of the Ministry of Agriculture and USAID Mission. Characteristic of those pitsos was that held in February 1983 at Molumong, attended by over 1000 persons, where the Honourable Minister of Agriculture, hailed the FRC's as "people's universities". Likewise, awards pitsos were held in connection with VAC short course certificates. A great deal of research information was shared on those occasions.

2.3.17 In-service training

Although all the above described training of MOA staff, chiefs, PCV's, farmers and others was indeed in-service, there is one remaining area which bears mention namely the in-service training organization for extension research personnel.

a) Continuing education at RD/FSR

A great deal of the in-service education of Extension colleagues at RD involved learning to do by doing. The frequent development of educational events and programmes involved the utilization of everyone's strengths and talents and a great deal of mutual learning. In-service education was formally conducted on the programme development cycle. In June 1982, a research extension assistant attended an intensive USDA course in Extension at the University of Missouri and participated in a guided field experience at Washington State University.

A rural sociologist departed in May 1983 for a degree programme at Washington State University. An in-service photography course was organized for all members of Extension Research, under the tutelage of an FSR advisor. Members of the section also attended an introductory computer workshop in December 1983.

2.3.18 Reports and publications for MOA and others.

Of course, the publication of research findings was central to Extension's role in Lesotho and was performed systematically.

a) Research circulars, bulletins, reports and special publications

It is to the lasting credit of the former expatriate advisor that a system for dealing with the publication of research results was designed and set in motion. The notion of simplifying single research topics in research circulars (fact sheets), which could form pages of a field manual in a dynamic and growing way, was a fact of life when the current expatriate advisor and principal researcher arrived on Lesotho assignment, and a few circulars had already been printed. It remained for Extension, however, to ramrod and edit the majority of the circulars now in print, and to extend the system to include the publication of reports, bulletins and special manuals and handbooks. The work was and is done by commercial printers since the Agricultural Information Services capability falls short of Research Division requirements. Some forty-one (41) circulars, twenty-nine (29) reports, thirty-two (32) bulletins and two (2) handbook/manuals were published. A standard distribution is made of these publications to assure that MOA professionals and other agriculturalists are best served.

2.3.19 Collaboration with research extension network

Collaboration among professionals toward a more fruitful research extension education network is desirable and involves a realm of activity to which Extension contributed a great deal.

a) With Extension Division and AIS

There was considerable effort toward bringing about a clearing-house effect on education, training, investigation, information and other common concerns among Research Division, Extension Division and Agriculture Information Services. Monthly meetings were and are held in order to share information, plan events and solve problems. Most RD/FSR extension education has enjoyed the inputs of those two entities.

b) With other technical divisions

In some of the educational events, RD/FSR required more expertise than then found at RD. Other MOA technical divisions were invited to participate and did. Thus emerged a healthy relationship and numerous joint efforts among RD, Crops Division, Farm Machinery, Livestock Division, Range Division, Conservation Division, Nutrition Section, and LAC.

c) With international project staffs

It is significant that Extension helped host the Pennsylvania State University delegation from the Cropping System Project in Swaziland who consulted and conferred in Lesotho about common concerns. Likewise, Extension travelled to Botswana in February 1984 to visit with personnel of GOB/MOA and Kansas State University's ATIP* (FSR) project. That international exposure was most rewarding.

d) With international consultant teams

There was a constant flow to and from Lesotho of consultants, project designers, project writers, project evaluators and voluntary agency personnel. In agriculture, it was inevitable that nearly all of them made major stops at Research Division and most of them consulted Extension/Research.

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* Agricultural Technology Improvement Project

The foregoing demonstrates the central and dynamic role of extension in farming systems research in Lesotho. The role continues, embracing expanded farmer education programmes and a series of agricultural extension schools in the districts. However, these current activities fall beyond the scope of this study.

There are several experiences somewhat unique to Lesotho which have been published in the interest of sharing them internationally.

Youmans and Holland (1983, pp. 11- 12) describe the special problems encountered in extending FSR results in Lesotho under circumstances in which the male head of the farm household is, more times than not, a migrant labourer. Such persons are farmers only in name since, in reality, they are fulltime miners. The tendency, however, is not to relinquish full decision-making authority to wives who are in fact the farmers on the land. These conditions have special implications to the design and dynamics of extension programmes.

Youmans, Trail and Matobo (1984, pp. 75 - 76) point out the importance of the village agricultural committees in terms of their value as contact groups, extension education organizations, volunteer leaders, and farmer/teachers.

Committee members assist in identification of problems, on-farm research, and extension of results.

Youmans (1985, p. 11) likewise identifies the critical nature of linkages in the farming systems research process and draws on the Lesotho experience in his discussion. FSR is fully integrated into the Research Division of the Ministry of Agriculture and expatriate advisors work as one with national colleagues. Extension professionals have been assigned to research as full members of the FSR team and an important part of their mandate is to build linkages for joint planning and programme delivery among the extension and other technical divisions of the Ministry. Youmans concludes by describing linkages also at work with other ministries and donor-funded projects.

2.4 SUMMARY

Farming systems research is a development strategy which aligns agricultural research with real life problems and needs of small farmers in the developing world and conducts that research in such a manner that scientists and farmers become problem solving partners, seeking solutions to low productivity directly on farmers' fields. Recommendations for new technologies, innovations and practices emerging from that exercise must be introduced to, and adopted by, larger numbers of farmers for any significant change to endure. The accepted steps in the FSR strategy are (1) target and research area selection, (2) problem identification and development of a research base, (3) planning on-farm research, (4) on-farm research and analysis, and (5) extension of results.

While the latter is traditionally the common and exclusive province of extension personnel and systems, it has been found that, in farming systems research, extension must play a much expanded role if the results of the FSR strategy are to have lasting effects among small farmers. Indeed, extension practitioners not only assist scientists and farmers in performing the several steps of the FSR process, they provide vital expertise and linkages without which the strategy cannot achieve its maximum impact.

In Lesotho, extension education plays a central and expanding role in FSR dynamics. Extension personnel assigned to the Research Division are members of a team which helps to identify sites, problems, and target farmers. They work in cooperation with researchers in on-farm research and demonstrations and in the extension of results. In addition, extension takes the lead in the organization and delivery of nonformal education programmes for three vital groups in the FSR process. These are farmers, chiefs, and extension workers and subject matter specialists of the Ministry of Agriculture. Further, extension develops linkages, advises consulting teams, counsels research scientists, provides feedback, and is responsible for the publication and other dissemination of research results in ways suitable to farmers, extension workers, scientists and other sector personnel.

In conclusion, extension education is a vital component in the farming systems research formula in Lesotho and in the rest of the developing world. Since extension education of farmers, village chiefs, and government extension workers and subject matter specialists is such a central part of extension's role in Lesotho and such a vital component of the FSR project itself, the impacts of those three areas of activity are studied and analyzed in subsequent chapters.

CHAPTER 3 THE IMPACT OF FSR EXTENSION PROGRAMMES ON MEMBERS OF FARMER CONTACT GROUPS IN LESOTHO

3.1 FARMER CONTACT GROUPS*

Early in the history of farming systems research in Lesotho, it became clear to both expatriate and national practitioners that the farmers engaged as cooperating farmers for field trials and enterprise testing would be far too few to constitute an effective network for the diffusion of agricultural innovations. Fortunately, the FSR expatriate team included an extension communications specialist supported in his mandate by a team leader and a rural sociologist, both well founded in extension education theory and methods. Concurrently, the Lesotho Ministry of Agriculture concluded that an extension and communications section must be attached to the Research Division in order to liaise with other ministry divisions and to facilitate cooperation and diffusion of innovations among farmers. Thus, a cadre of extension oriented personnel was present at the outset to deal with the joint problems of farmer organization and extension education.

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*Members of farmer contact groups (VAC's) are farmers themselves elected by residents of villages for their known leadership and farming abilities. They are perhaps more innovative than representative. These groups are active only in the FSR prototype areas.

Considerable talent was brought into the exploration of concepts deriving from extension education, cross-cultural communications, local tradition, group dynamics, and diffusion theory. This served not only to confirm the need to organize a farmer-based diffusion network but also gave emphasis to the desirability of making such network as consistent as possible with Basotho* tradition. Meanwhile, pitsos were held during the last six months of 1979 in the prototype areas of Molumong, Nyakosoba and Siloe in order to orient chiefs and farmers in farming systems research concepts and to introduce FSR expatriate advisors to the farming communities. That series of encounters reinforced the growing conviction of the need to organize some form of farmer contact group in each farming community within the three prototype areas. The village agricultural committee form of organization seems to have gained consensus at that time, and such committees (VAC's) were organized and oriented throughout the prototype areas during 1980.

Further to the introductory pitsos mentioned above, a second series of orientation pitsos was held together with respective chiefs in order to explore the notion of village agricultural committees with members of the farming community.

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* Basotho are the resident African people of the Kingdom of Lesotho, whose language is Lesotho.

These pitsos were organized by personnel of the extension section of the Research Division who were by that time fully trained in farming systems research philosophy and methodology. Discussions in the villages gained farmer acceptance of the VAC concept.

A third series of pitsos was held, one in each village, in order to organize the VAC's. It was decided that villagers/farmers themselves should elect their own committee members based on a criterion of recognized local leadership and known farming ability. The election pitsos were supervised by FSR extension personnel from the Research Division. It was decided that each committee would be made up of eight members consisting of a chairman, vice-chairman, secretary, vice-secretary, treasurer and three representatives. There would be as many VAC's as there are villages in each prototype area. Candidates would be nominated publicly at the pitsos and vote was to be by show of hands with the receiver of the greatest number of votes declared winner of the seat. Each position was to be elected separately. No candidate would be excluded on the basis of age, sex, or for any other motive.

Early in 1980, the village agricultural committees in the three prototype areas were elected. The election pitsos were convened by the respective chiefs and headmen/headwomen and monitored by FSR extension workers. Seven VAC's were elected in Molumong for a total of 56 members. In Nyakosoba, ten VAC's were elected totalling 80 members. Eleven committees were elected in Siloe, adding 88 members and bringing the FSR constituency of VAC members in the prototype areas to 224.

Much of the remainder of 1980 saw an in-depth orientation of VAC members. They were instructed in their individual and collective roles as representatives of the farming communities, partners in farming systems research, providers of feedback to researchers and extension workers, disseminators of information and innovations and teachers. It became obvious that so many far-flung committees would need some type of coordinating body in each prototype area and FSR steering committees were elected from among the VAC's in Molumong, Nyakosoba and Siloe*. The steering committees also consist of a chairman, vice-chairman, secretary, vice-secretary and treasurer with the remainder of persons in each area as members. Since each VAC sends a single member to the steering committee, the Molumong committee has seven members, the Nyakosoba committee ten members and the Siloe committee eleven members.

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* VAC (farmer contact group) members subsequently trained through extension education reside only in FSR prototype areas.

At this writing, the VAC's (farmer contact groups) are active and vigorous. Both VAC and steering committee members must stand for election each year. This reduces the tendency for non-performers or disinterested members to hold offices they do not adequately fulfil. However, the majority of the membership has been consistently re-elected over the years.

An important strength of the VAC structures, which in later years were chartered as agricultural cooperatives in Molumong and Nyakosoba, is their function as sounding boards and feedback organizations which inform and guide agricultural research in Lesotho. This, of course, is in addition to member roles as "farmer researchers, disseminators, and teachers". The establishment of VAC's in Lesotho has been seen as a major breakthrough in engaging farmers in the agricultural development process.

3.2 EXTENSION EDUCATION PROGRAMMES

The next and the prevalent continuing step in the farmer contact group (VAC) process was, and is, extension education*.

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* Based on needs stipulated by the Ministry and articulated in the Project Paper.

In order to fulfil expected roles, members not only had to be refreshed periodically on the nature of those roles, but also needed in-depth extension education in agriculture. This agricultural extension derived basically from two sources. The first consisted in the knowledge held by Research Division and FSR practitioners which could contribute to the solution of local problems as identified by farmers themselves. The second had as its basis the results of on-farm farming systems research, concurrently in progress, which provided sound recommended changes in farming practices and products. The intended outcome of the extension education programme among VAC's was the improvement of the productivity, the economics, and the quality of rural life*.

In July and August 1981, extension education programmes were held at the farmers' training centres (FTC's) in Mokhotlong, Matela, and Mohale's Hoek for VAC representatives from Molumong, Nyakosoba and Siloe respectively. The curriculum was standardized as a result of inputs from research and extension officers and consultation with farmers. Attendance from the three prototype areas numbered 96 persons.

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* Objectives of FSR/E in Lesotho

The curriculum included the nature of adaptive research, attitudes about agronomy, responsibilities of VAC's and their terms of reference, attitudes about marketing and farm management and rural sociology. Technical instruction was given in seed-bed preparation, manuring, inorganic fertilizers, fodder seed, grains and pulses, and recommended varieties of various crops and times of planting (agronomy). Calibration of ox-drawn planters, ploughs, and other equipment was taught (farm machinery).Instruction and demonstrations were given in seed-bed preparation for vegetable seedlings, early production of cabbage, potato production, direct sowing of vegetable seeds, the compost pit/heap, planting of young fruit trees and pruning of established fruit trees (horticulture). VAC farmers were likewise instructed in the feeding of the dairy cow (livestock), grazing control regulations and rotational grazing (range), simple record keeping (farm management), and local markets (marketing). This curriculum was felt to be appropriate in addressing identified concerns. All instruction was in Sesotho by national research and extension officers or interpreted from English instruction by expatriate advisors (Sefeane, 1981, pp. 1 - 7).

The programme was evaluated to determine the immediate impact of instruction on the 96 participants. With respect to preferred time for farmer extension education programmes, 29 (30,2%) persons indicated summer is best, 28 (29,2%) respondents felt winter is most convenient, 36 (27,1%) liked autumn best, while 13 (13,5%) expressed a preference for springtime education programmes. The responses were somewhat expected, given the seasonal demands of agriculture. A second question regarding appropriate venue for farmer extension education found 21 respondents (21,9%) favouring home instruction, while 75 (78,1%) indicated satisfaction with the farmers' training centres at that time. VAC members were questioned as to their impressions about the level of instruction. Rating the instructional level as appropriate were 87% of the respondents, while eight per cent felt it was inappropriate (too high or too low), according to Sefeane (1981).

Questions were also asked about teaching methods and respondents instructed to list two preferences. Learning by doing scored 54 marks while listening to instructors was scored 63 times. Group discussion drew 59 scores while observation was checked only 3 times. As to clarity of instruction, over 90% of the respondents thought the presentations were clear and to the point. A full 100% indicated the programme was relevant to problems on the farms. And, finally some 82% of the participants were happy with board and lodging at the three farmers' training centres (Sefeane, 1981, pp. 7 - 13).

Sefeane concluded that farmers fail to adopt innovations because they lack the appropriate skills. He was prompted to classify farmers as backyard, middle, and commercial/mechanized, and concluded that technology overload is a danger in extension education programmes. He added his comment that farmers are generally intelligent and rational and that recommendations must be compatible, triable, visible and relevant in order to be adopted. His field recommendations at the time centered on a call for FSR trials on cereals and fodder crops. The Sefeane report documented useful information at the input, activities, people involvement, and reaction levels of evidence according to Bennett (1980).

A second farmer (VAC) extension education programme was conducted from March 29 through April 30, 1982 for committee members from the three prototype areas. Instruction was held at the ministry-operated Mokhotlong, Matela and Mohale's Hoek farmers' training centres. Attendance from the VAC's numbered 98 participants. Content of the curriculum included the responsibilities of VAC's and values clarification. Technical education was provided on seed selection from composites, manures and fertilizers, winter fallowing, weed control, seed viability tests, seed storage, planting operations, and results of a winter wheat experiment (agronomy). Further education was provided on the control of smut in wheat and maize, control of aphids in cabbage, stalk-borer treatment, cutworm control, rodent control and other diseases and pests (plant protection). Ox-drawn equipment was discussed to include ploughs, yokes, harrows, and planters (farm machinery). Carrots, onions, beetroot, cabbage, tomatoes and spinach received attention as important garden crops, and compost heap making was reviewed (horticulture). Instruction was given in animal science about roughages, concentrates, starting a farm poultry flock, and the implications of the national abattoir for Lesotho's livestock industry (livestock). Animal breeding and culling was also discussed. Finally, common animal diseases were explored such as sheep scab, black quarter, blue tongue and pulpy kidney (veterinary services). The intensive curriculum was concluded on schedule (Matobo, Sefeane and Youmans, 1982). Farmer contact group (VAC) members' reactions were positive as indicated by the number and quality of the questions raised for discussion. A post instruction evaluation was conducted among 47 VAC members who attended the 1981 instruction. Results showed that committee members understood their roles as those of coordinators among farmers and research officers and advisors to farmers on agricultural activities. They also understood and used organic manures, and had begun to try inorganic fertilizers. Many respondents reported planting barley, oats and lucerne for fodder though others had not attempted to grow fodder crops. Farmers generally recalled recommended varieties of peas, maize, sorghum, wheat and beans and had expended more money to purchase improved seed. Some 20 of the 47 respondents reported having begun to cull livestock. Those who had not, indicated very small livestock numbers. Respondents generally understood and favoured new grazing control regulations (Matobo, Sefeane and Youmans, 1982, pp. 2 - 5).

In addition to the evaluation of the prior year's extension education programme, another instrument was administered in order to evaluate the immediate reaction to the 1982 courses of instruction. All respondents reported that the discussions on the responsibility of the VAC's had been helpful. Response to questions about agronomy indicated that topics were generally clear and instructional methods appropriate. Exceptions were found among Siloe respondents, a few of whom did not understand the instruction in agronomy. Some 56 per cent of the participants reported that they were able to read the instructions for and use pesticides. Others would only use them if somebody read the instructions for them, and a minority stated that it was easier to read instructions than to actually use the chemicals. A majority of the participants were satisfied with what they had been taught in horticulture.

Certificates of completion were presented to the participants at ceremonies in their home communities in order to share their accomplishments with the larger society and to identify for that society an important cadre of resource persons (Matobo, Sefeane and Youmans, 1982, pp. 5 - 6) Thus, a comprehensive report on the results of the second year's extension education of VAC members was rendered at the inputs, activities, people involvement, and reaction evidence levels.

An extension education course for Molumong VAC members was held at the Mokhotlong farmers' training centre on March 14 - 18, 1983. Attendance numbered 30 persons. The content of the course was again delivered by national research and extension officers in Sesotho, advised by expatriate FSR practitioners and researchers. It included technical update material on maize, wheat, peas, and beans as developed through the on-farm activities of farming systems research. Land preparation, fertilizer usage and rates, time of planting, and recommended seed varieties ensued (agronomy). Production of cabbage, carrots, onions, potatoes, spinach, beetroot, seedbed preparation, fertilizers and manures, time of planting and recommended varieties were also taught with respect to vegetable crops (horticulture). Information was shared on common pests in mountains and plant disease prevention and control (plant protection). Rotational grazing, proper stocking rates, and fodders such as wheat chaff, peas stover and maize stover were discussed (range). Principles of marketing were explored (marketing). The culling and selection of animals, feeds and feeding, common diseases, internal and external parasites, and the livestock importation policy were important subjects for stockmen and graziers (livestock). Topics in rural sociology (rural sociology) concluded the programme. Responses were generally positive (Tsiu, 1983, pp. 1 - 3).

In early 1983 a series of events occurred which radically altered the extension education model for VAC members in terms of venue, structure and strategy. In January and February, three field research centres, constructed under the Farming Systems Research Project, were officially opened in Molumong, Nyakosoba, and Siloe. Each centre consisted of housing for resident research extension assistants and visiting officers, a large shed with storage rooms and water collection tank, and limited land. This development was hailed by Lesotho's Minister of Agriculture as the commencement of "people's universities" where advancements in agriculture and domestic economy could be shared with the people in their own communities. Concurrently, recommended improvements and technologies emerging from FSR on-farm trials work began to multiply. Finally, research extension personnel and the director of research began to explore ways to maximize farmer education while minimizing the cost of same. This was important, anticipating the eventual decline of donor funding. It was then that the change of venue, structure, and strategy for VAC education was conceived (Youmans 1983, pp. 1 - 2).

The change of venue of VAC education from the traditional boarding farmers' training centres in Matela and Mohale's Hoek to newly opened field research centres at Nyakosoba and Siloe involved both reorientation of VAC members and considerable logistics. Changes from prior room and board arrangements to participant self-financing of transportation and food were somewhat drastic. Consideration was given to such aspects as provision of lorry transportation to and from distant or remote locations and emergency lodging. Maintenance of high attendance rates at educational events and reduction of attrition became primary concerns. Making instruction sufficiently interactive and interesting to assume voluntary attendance, presented a singular challenge and represented an abrupt departure from the former "captive audience" situation at the farmers' training centres. An experimental model for the education of VAC members at Nyakosoba and Siloe was designed for testing during April 1983 (Youmans, 1983, pp. 2 - 3).

The components of this model follow. The structure for instruction was to be a short course of three full days' duration. Instruction was to be presented in the sheds, equipped with benches, at the field research centres. Chalkboards were to be acquired for graphic illustration. The curriculum was to include orientation by research extension officers, subject matter education in Sesotho by national research officers, and field trips to crops and horticultural sites for participants. Transportation by lorry was to be provided to participants travelling long distances and also for field trips. Largely, however, participants were to be held responsible for their own transportation. They were also to be instructed to provide their own food and beverages and to attend without interruption for three full days. Tea was to be provided by Research Division/FSR, but participants were to be instructed to bring their own cups. Research extension personnel were to be assigned one Land Rover and were scheduled for a total of five days at each site for the administration of the courses. Research officers were to be enlisted for subject matter presentations, procuring departmental transportation for that task. Opening and closing ceremonies would be officiated by research and FSR personnel and the courses evaluated by research extension and rural sociology officers. Certificate of attendance pitsos were to be scheduled at later dates (Youmans, 1983, pp. 3 - 4).

The short course for Nyakosoba VAC members was held on April 12 - 14, 1983. Since there were no restrictions on space or facilities, all VAC members in the prototype area were invited and encouraged to attend. The short course for Siloe was held on April 19 - 21, 1983. Both courses were held at the RD/FSR field research centres which had been constructed with USAID funds through the Farming Systems Research Project. Participants in both cases brought their own food and beverages and supplied their own cups for tea. In large part, participants came and went by their own means although the FSR truck did, in both venues, provide tranportation to remote areas as well as for the field trips. Education at both sites included orientation, topics in agronomy, agronomy field trip, topics in horticulture, horticulture field trip, farm machinery, calibration of ox-drawn planters, topics in livestock and plant protection.

The attendance at Nyakosoba numbered 61 persons who attended consistently, excepting the untimely illness of one lady. The attendance at Siloe was a consistent 97 persons, with five additional participants the second day and two additional participants the third day. This participation represented a considerable increase in attendance over the

28 and 38 attendance figures of 1982 courses at Matela and Mohale's Hoek FTC's. The participants were highly interactive in educational activities both at the FRC sheds and during the field trips.

As seen above, the change of educational strategy and venue had a positive effect on attendance. It was, however, not conclusive since attendance might also have increased at a five-day course at the FTC's if funding and space permitted extending that opportunity to more people. Evidence indicated that participants had attended several and varied kinds of educational activities over recent years.

Of 140 respondents to the evaluative instrument, 114 requested more instruction in agronomy, 92 wanted more knowledge about horticulture, 73 checked plant protection as a continued training need and 67 indicated a need for more education in livestock matters*.

Regarding length of course, 63 participants (45%) preferred a five-day course while 27 persons (19%) were content with the three-day option. Items liked about the three-day short course at the field research centre were many and varied. Included were such comments as relevant topics, good conduct, impressive teaching methods, good course content, good lecturers and adequate transportation back-up. Others were nearness of centre to home, knowledge gained to be shared, location of course at research centres, working together and sharing with different resource specialists. Still others commented favourably about punctuality, lecturers' relationship with research extension assistant, exchange of ideas opportunity, hospitality, good course organization and breadth of advice. Finally, other participants made positive statements about presence of chiefs, running of course, eagerness to learn among participants, high course standards, right number of days allocated for the course, getting to know one another, learning to adapt to new course strategy and, last, that participants were not forced to attend.

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* Constitutes self assessment of continuing needs.

Items not liked were fewer and included course was too short, time per topic not sufficient, inadequate toilets, daily commute to centre a problem, travelling conditions a hardship, and absence of food provision a constraint.

Respecting course content to be taught in future farmer educational events, 40 participants (29%) wanted continued education in agronomy, 22 persons (16%) felt a need for training in poultry, 19 participants (14%) wanted more education about ox-drawn equipment, 15 (11%) indicated a need for more knowledge in horticulture and 14 (10%) wanted to learn more about livestock/animal diseases (Youmans, 1983, pp 4 - 6)*.

This account and subsequent evaluation seems to have dealt with specific programme results at the inputs, activities, people involvement, and reaction evidence levels.

At the urging of Lesotho's Minister of Agriculture, the farmer contact groups (17 village agricultural committees) in Molumong and Nyakosoba were organized and chartered as agricultural cooperatives during 1984. This in no way adversely affected their roles as farmer contact groups in the context of farming systems research.

It did open up some opportunities for credit, loans, and group purchasing and marketing. The training and organizational activity involved in the transition was executed by Ministry of Cooperatives and Rural Development personnel in cooperation with research extension officers.

By the time extension education events were scheduled for 1984, the Nyakosoba VAC's were operating under a central cooperative framework. Short courses were held for those VAC's on September 4 - 7, 1984 and for the Siloe VAC's on September 18 - 21, 1984. Joint attendance was 87 persons. Curricula centered on topics in horticulture, agronomy, plant protection, fodder production, demonstration of Areana ox-drawn machinery, and calibration of same.

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A "spin-off" extension education programme of FSR in Lesotho is the on-going nutrition education process. Women farmers who were successful and enthused with home garden activities of farming systems research in Nyakosoba expressed a need to learn methods of storing some of their garden produce and of preparing nutritious meals for their families using home grown vegetables*. The extension research section of the Research Division responded to this expressed need by jointly organizing and giving a course together with the nutrition section of the ministry at Nyakosoba. This course was organized around the themes of production, preservation and preparation of home garden grown food.

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* Another objective of FSR/E in Lesotho.

It targeted 100 women who had been involved in home garden education through farming systems research and was held at the Nyakosoba field research centre from March 1 - 4, 1983, (Ramakhula, 1983, pp. 1 - 3).

The content of this course, according to Ramakhula, (1983, p.3) centered principally on nutrition. Methods of food preservation were taught including food drying in simple home constructed food driers and hot and cold air exclusion packing methods. On the food preparation side, simple nutritious ways of cooking vegetables, preparing salads, and feeding the family were taught. Despite inclement weather, 72 of the 100 targeted women attended the course regularly.

Ramakhula reports that women farmers' reaction to this course was most positive (1983, p.3). They were highly interactive, worked long hours, and compiled home cookery recipe books. They also organized a cookery club which agreed to meet monthly with the district nutritionist for lessons on food and family nutrition. The extension research section of the Research Division also addressed the need for home economics and management instruction voiced by women farmers by coordinating with home economics assistants in Mohale's Hoek and Maseru districts, in conducting home economics courses at Siloe from 20 - 24 February, 1984 and at Nyakosoba from 7 - 11 May, 1984. A total of 92 women consistently attended these courses according to Ramakhula (1984, p. 1) and numbered many teenage girls in addition to women farmers. Predicated on a realization that women's roles in development are often ignored, the course objectives addressed the need for women to produce and utilize food for their families, the need to store perishable food and avoid waste, and the need for home management skills to include nutrition, community resources, home improvements, and family care and health. Based on such objectives, the course content included the use and preparation of home-grown foods, the three basic food groups, use of left-over foods, and improvement of traditional dishes. All foods used in this instruction were home-grown and provided by the women farmers. The women were also taught how to prevent waste and spoilage of perishable food through use of simple home-made coolers. They were also trained in solar drying of fruits and vegetables. Further course content included programming of housework, budgeting, money management, and family health as influenced by proper nutrition, clean drinking water, adequate ventilation, exercise and eating habits. Making of family clothing through sewing, knitting and crocheting skills were taught and home remedies for common colds, tired feet and chapped hands were reviewed. (Ramakhula, 1984, pp. 1 - 3).

Ramakhula reports (pp. 3 - 4) that reactions to the instruction were very positive as demonstrated by the frequency and variability of questions and requests for advice. Since courses of five days each are not sufficient to address the magnitude of this need, it is significant that good linkages were established between women farmers and home economics assistants in the districts.

Another indicator of positive reaction was the women's willingness to supply all the home-grown food for the courses and to contribute to the purchase of supplementary items.

The above commentary documents the outcomes of home economics instruction by the extension research section and the home economics assistants and nutrition section of the ministry. It does so at the inputs, activities, people involvement, and reactions levels of evidence and describes another important linkage between farming systems research and farmers.

Also in 1983 - 1984, farmers' field days were held in Siloe (livestock), Nyakosoba (crops), and Molumong (crops). Altogether 140 farmers attended those field days where agricultural subjects were observed and discussed.

Since 1981, research extension personnel have prepared and broadcast agricultural radio programmes over Radio Lesotho each Saturday morning. That extension education programme was in response to indications in the FSR baseline survey (Butler, 1982) that farmers in the prototype areas depended importantly on the radio for information about agriculture (Trail, 1982, pp. 14 - 21). The Research Division of the Ministry of Agriculture, in the context of the FSR extension education effort, consistently produced 52 radio programmes per year.

The above is an account of the type, frequency, and content of extension education programmes in the FSR context from 1979 through 1984. The programmes are described and evaluation results reported as they apply to inputs, activities, people involvement, and reactions levels of evidence as identified by Bennett (1980).

3.3 THE RESEARCH PROBLEM

The research problem associated with the impacts of farming systems research extension education programmes on members of farmer contact groups (village agricultural committees/coops) centres on the vital need to learn of tentative effects and potential benefits of those programmes beyond the rather soft perceptions about input, activities, people involvement and reactions. In the context of FSR philosophy and practice, it is necessary to determine the kinds and extent of perceived behaviour changes among the VAC membership in terms of what has been learned and retained in both the knowledge and skills realms and how that is associated with attitudes and aspirations. Further, since the FSR strategy is ultimately results-oriented, the degree of practice change among the clientele needs to be determined and, where possible, the real benefits (end results) ascertained.

Thus the objective of this research is to determine the perceived impacts of the extension education programmes during 1979 - 1984 of farming systems research in Lesotho on members of farmer contact groups (village agricultural committees/coops) as those impacts may be ascertained in the areas of knowledge, attitudes, skills and aspirations change, reported practice change and results or real benefits to farm families as felt by the farmers themselves.

3.4 METHODOLOGY

As was explained in Chapter 1, the methodology selected for the accomplishment of the research task at hand is the reflective appraisal of programmes (RAP) strategy. This is an approach developed by Claude F Bennett and associates (1982) for the study of clientele-perceived results of extension education programmes.

Bennett has developed a state of the art method of appraising extension programme impacts through reflective perceptions of participants as related to a hierarchy of evidence of learning levels. Included in the hierarchy are (1) inputs, (2) activities, (3) people involvement, (4) reactions, (5) KASA* change, (6) practice change, and (7) end results. The first four of these seven levels of evidence (Bennett, 1980, pp. 4 - 12) have been determined in the preliminary account, description, and evaluative results of the programme in question. Analysis of the KASA, practice change, and end results levels must obviously be sought in order to add strength to the evidence of the programme impacts and to complete the evaluative profile of the educational intervention (Bennett, 1977, pp. 11 - 14).

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* The KASA acronym denotes changes in knowledge, attitudes, skills, and aspirations through education.

The RAP methodology is emminently suited, indeed has been specifically developed for, the collection and evaluation of data at all seven of such evidence levels and specifically aims toward seeking information from as high a level on the evidence hierarchy as possible. As explained earlier, RAP seeks reflective evidence through interview questionnaires about the results of extension education programmes as perceived by the participants in those same programmes. RAP freely admits that the data are reflective as well as subjective, but argues that extension education is a reflective phenomenon and makes no apology for its subjectivist posture. It does warn against bias, distortion, and other influences and provides methods for minimizing their impacts.

RAP uses a standardized set of interview questions which can be adapted to any programme to be evaluated*. Results can be important for decision-makers in assessing new programmes, modifying and improving on-going programmes, accounting for activities within and outside the organization, and responding to specific objectives such as farming systems research.

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* RAP has been used by Technoserve personnel in evaluating in-service training programmes of farm cooperatives of El Castano Project in El Salvador, and in Peru.

The RAP methodology can be used by practitioners (extension workers) themselves in evaluating programmes and is not critically constrained by absence of baseline data or control group populations. In RAP, the levels of evidence are standardized evaluative plateaus and are easily understood by colleagues and administrators familiar with the methodology.

Since RAP is a subjective research method, factors which may tend to bias or "soften" data must be countered by such practices as sharing the interview task, clarification of the scope of study to interviewees, use of open-end probe questions to "tighten up" positive but vague responses, and reviewing and describing programmes crisply with interviewees to reduce memory lapse.

RAP also offers some alternative methods for collecting evidence on programme results. They are (1) interviews, (2) questionnaires, (3) expert opinion, (4) observation, and (5) analysis of documents. Methods 4 and 5 have been and will be liberally used in reporting results of the first four evidence levels. Methods 1 and 2 will find ample application in the data collection and compilation phase of the evaluative exercise for KASA, practice change, and end results evidence levels. Method 3 will come into play in the summaries of findings in Chapters 3, 4 and 5, and importantly in Chapter 6.

3.5 DATA COLLECTION

Data on the influence of FSR extension programmes on members of farmer contact groups in Lesotho were collected by means of carefully designed interview questionnaires. Referring to the RAP methodology guide (Bennett, 1982, pp. 9 - 13,) it was decided to seek and collect data at evidence levels 5, 6 and 7, namely KASA change, practice change and end result. It was felt that the programmes to be studied had occurred over a time span long enough to permit desired change, and even end results, but not too long so as to be severely hampered by memory lapse*.

The interview questionnaire contained a brief introduction designed to inform the interviewee of its purpose and scope. A block of biographical data questions followed with the purpose of developing a social/educational/occupational profile for the respondents. The extension educational events together with dates and venues, were listed briefly in order to identify for respondents dates, venues, specific curricula and events.

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* It must be remembered that KASA change may be influenced by extraneous educational experience, and practice change and end results by economic and environmental factors, whether or not thus perceived.

The cumulative content of the farmer contact group education programme was listed so that it might be reviewed with each respondent to refresh recall potential. The field days were then enumerated and described along with venues and dates. Finally, the radio programmes were described explaining the general content and time of broadcast.

The programme description was validated with the respondent by means of a single validation question. A reaction question was asked in order to reconfirm or contest earlier evaluation outcomes through the reaction evidence level. Two questions on extension methods and venue were asked in order to determine preferences among respondents. Specific standardized but modifiable questions were then asked about every general subject matter content area in conjunction with all four KASA change components, practice change, and end results. The responses could be entered on a matrix in numerical values which corresponded to qualitative values of a Likert scale. Open-end probe questions were provided for in standardized question form, but at the discretion of the interviewer, in order to confirm or gain information about positive, negative, or questionable responses. Closed-end probe questions followed in order to construct an agricultural profile for the respondents. Lastly, respondents were asked about end results (real benefits) associated specifically with participation in the FSR extension education programmes. Two final questions on constraints and recommendations were designed to reap first-hand feedback on programme outcomes from involved participants.

A single female Mosotho colleague* of the principal researcher was selected to conduct all the interviews among members of the farmer contact groups (village agricultural committees/coops). This research assistant knew all of the respondents personally since she had participated in the several extension education events, including organizational and monitoring work among the committees, and was known to be highly respected by them. She was thoroughly trained in RAP methodology by the principal researcher and was asked to review the English draft of the interview instrument (questionnaire). After minor adjustments, the research assistant worked closely with qualified colleagues to translate the instrument into Sesotho and test it among colleagues against the English instrument for accuracy of intent and content.

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* C M Ramakhula holds a Certificate in Agriculture from Lesotho Agricultural College and a Diploma from National Teacher Training College. She was trained in extension by USDA at University of Missouri and in the RAP methodology by the principal researcher. She is currently studying for the B.Sc. in general agriculture at Washington State University.

She was instructed to consider her initial interviews as tentative until she was certain the questions were fully understood and were eliciting uniform responses, thus addressing the field testing question with no loss of time. Any misunderstanding or confusion was to be reported. There was none of significance. The lists of members of the farmer contact groups (village agricultural committees/coops) known to have attended one or more extension education events were assembled and every third name selected for interview. These attendance lists were developed as farmers randomly arrived for the courses, thus satisfying the principle of randomness. Of the total VAC membership of 224 persons, 194 had attended organized training events. Of the 194, a sample of 64 was selected by ticking every third name on the lists. Of the 64 persons engaged for interview, 54 viable questionnaires were returned, an 84% sample response and a 28% population response. The research assistant was instructed to attempt to reach each interviewee a maximum of three times. Reports sustain that persons who were not reached had moved away, were working in South Africa or were simply unavailable. Thus, the sample of 54 persons forms the basis of subsequent data presentation and analysis.

The research assistant conducted the interviews face-to-face in the field in Sesotho at the respondents' farms and villages in late 1984 and early 1985. Since she knew all the participants personally and had been a regular extension worker carrying out her work among them, there was little difficulty establishing rapport and gaining access and trust. These face-to-face encounters were most valuable since they afforded a direct opportunity to explain in Sesotho any question not fully understood. Choice of a single interviewer avoided distortion in the interviewing technique, assuring uniformity of style. The research assistant filled out the questionnaires herself in Sesotho noting respondents' comments carefully. This was done to assure consistency since numerous respondents were unused to dealing with written forms, and a few could not write. Responses to open-end probing questions were condensed by the research assistant in the interest of subsequent compilation and tabulation. The data were then translated into English and transferred to fresh English forms for the usefulness and benefit of the primary researcher. In the above manner, the 54 sets of research data were gathered and presented for further analysis.

3.6 DATA PRESENTATION AND ANALYSIS

As in Bembridge, Steyn and Williams (1983, pp. 15, 137) in their comprehensive evaluation of the KwaZulu Extension Service, and consistent with the general recommendations of

Bennett (1976, 1980 and 1982), the data gathered from the farmer contact group sample were checked and coded for computer analysis. A second research assistant was engaged for this task. The data were clear and reflective of farmer perceptions like the KwaZulu study. Thus, no further sophisticated statistical analysis was considered necessary for reporting the findings in this chapter.

3.6.1. Biographical data

a. Age and sex

A computer assisted analysis showed the age range for the 54 respondents (considered here to be a sufficiently large sample size to extend to the entire population) was 21 - 71 years. The mean age was 46,6 years. Analyzed by age intervals, 7,4% were found to be in the 21-30 group, 18,5% in 31-40 years, 33,3% were in the 41 - 50 interval, 25,9% were from ages 51 - 60, 11,1% were between 61 - 70 years of age, and 3,7% were 71 years or older.

When the data were analyzed for the sex of the sample respondents, 41 (75,9%) were women and 13 (24,1%) were men. This finding is likewise expected to extend to all members of the farmer contact groups. Seen in this context of sex, the female age ranged from 21 - 71 (mean 44,2%). The range for males was from 39 - 70 years (mean 54,2%). These data can be seen graphically in Figure 3.1. They show dramatically the virtual absence of men in farmer contact groups between the ages of 21 and 40, as well as the marked predominance of women in the groups through age 50, and their consistent majority throughout all age groups. This configuration is suspected for Lesotho's farming population at large and is thought to be related to the reported 208 000 miners said to be in the Republic of South Africa. Since all 54 respondents were either married or widowed, it also justifies an alertness with respect to content and context of extension education programme design.

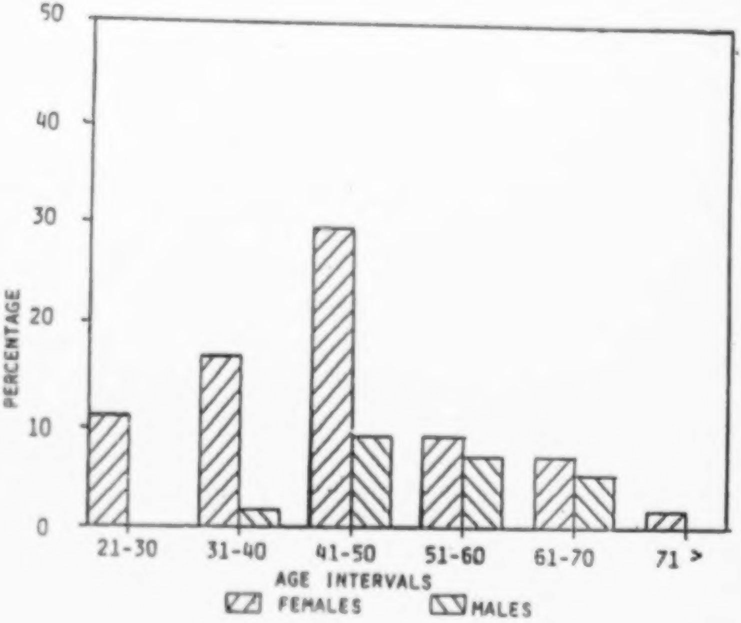
b. Family size

The 54 respondents had 197 children (mean 3,65). Since it has already been seen that women as young as 21 may farm and that men from 21 - 40 years of age are absent from the farms, children's ages were not compiled. They are available in the raw data.

c. Prototype area distribution

Respondents' villages of residence were not found to be relevant to this study. Their residence according to prototype area is, however, of interest. Of all

FIGURE 3.1: AGE DISTRIBUTION OF FEMALE AND MALE RESPONDENTS FROM FSR FARMER CONTACT GROUPS, LESOTHO, 1985



respondents, 6 women and 3 men were from Molumong, 18 women and 3 men were from Nyakosoba, and 17 women and 7 men were from Siloe. Totals are Molumong 9, Nyakosoba 21, and Siloe 24. These data are found in Table 3.1.

d. Farming experience

The respondents reported total farming experience of 804 person/years (mean 14,9 years/ respondent). The range in farming experience was 0-46 years. These data are also in Table 3.1.

These data related to age and the viability of farmer contact groups* as an innovations diffusion network will become evident later in the study.

e. Formal education

All but 6 respondents had attended school. Of these, 6,5% reported no schooling and 4,6% did not respond. The 48 (88,9%) who had attended school were in a range from Standard 1 - Standard 7 (mean Standard 4,2).

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* The terms "farmer contact groups", and "village agricultural committees", and (later on) "farmer cooperatives" are synonomous in this study.

TABLE 3.1: BIOGRAPHICAL DATA ON MEMBERS OF FARMER CONTACT GROUPS, LESOTHO, 1985

	BIO.DATA						
RESP. NO	AGE	SEX	AREA	YRS/FRM	EDUC(Std)	MIG/RSA	TYPE WORK
1	42	Female	Nyakosoba	15	5	1	M
2	48			37	2	1	M
3	62			14	7	6	M
4	36			6	6	0	
5	47			24	6	1	M
6	42			11	5	1	M
7	59			25	1	0	
8	42				1	3	M
9	30			5	6	1	M
10	71			30	1	0	
11	50			20	6	3	M
12	50			20	3	1	M
13	55			15		5	M
14	31			5	4	1	M
15	43			10	5	1	M
16	50			20	5	1	M
17	45			5	3	1	M
18	40			13	3	1	
19	32	Female	Siloe	4	4	3	M
20	27			7	7	2	M
21	40			12	4	0	
22	55			3	6	2	M
23	28			2	7	1	M
24	48			14	3	1	M
25	48			25	1	2	M
26	69			4	2	0	
27	52			10	2	1	M
28	39			0	4	4	M
29	56			31	5	1	M
30	34			6	3	8	M
31	42			12	3	2	M
32	30			2	7	4	M
33	35			5	4	1	M
34	48			5	6	4	M
35	43			12	7	0	
36	21	Female	Molumong	5	7	1	M
37	45			27	6	0	
38	31			3	4	1	M
39	62			36	4	3	M
40	24			6	6	6	M
41	62			36	4	3	M
42	55	Male	Nyakosoba	30	0	1	M
43	50			25	0	1	M
44	50			20	0	2	M
45	51	Male	Molumong	20	2	0	
46	59			12	1	2	M
47	65			35	0	1	M
48	49	Male	Siloe	14	0	0	
49	39			3	5	0	
50	64			46	5	4	M
51	48			4	1	3	M
52	47			12	3	0	
53	70			20	1	2	M
54	58			12	5	1	M

The educational mean for the total sample was a Standard 3,8. These data are in Table 3.1.

f. Migrant labour

Of the total sample, 43 (79,6%) persons said that one or more members of their immediate families work in the Republic of South Africa. Those migrants ranged from 1 - 8 persons (mean 2,02), and totalled 87 workers. The migrant labour mean for the entire sample was 1,61 persons per household. In the cases of migrant labour reported, the migrants' occupation was overwhelmingly mining. Only two migrant farm labourers and two domestic servants were reported. Migrant labour data are in Table 3.1.

3.6.2 Farm characteristics

Most of the farm characteristics reported here are based on 53 respondents since one person declined to supply farm data. Accurate farm size could not be determined since many respondents reckoned size in number of "fields" while others reported measurements in acres.

a. Field crops

Respondents said they grew maize, sorghum, wheat, beans and peas on their land. These crops were reported roughly in that order.

b. Farm machinery

Farm machinery was owned by 29 respondents (54,7%). Of those owning machinery the most frequent implement reported was the plough. The numbers of cultivators and planters were comparable. Harrows were rare. Presumably all machinery reported is ox-drawn. One person owned a petrol engine pump for irrigation.

c. Horticulture

Horticulture crops were somewhat more varied. Those reported included cabbage, tomatoes, beetroot, carrots, radish, potatoes, pumpkins, spinach, onions and lettuce. It is significant that 50 of 53 respondents (94,3%) grew home gardens. This finding seems positively related to FSR horticultural research and extension education programmes. Likewise, 47 of 53 (88,7%) participated in communal gardens. While the communal garden movement is officially the province of the Ministry of Cooperatives and Rural Development, there is reason to believe that intense activity by FSR related Peace Corps volunteers and research extension assistants in Siloe and Molumong is associated with this significant accomplishment.

d. Weeding and pest control

All 53 respondents to farm characteristics questions said they weed their crops and gardens. Likewise, all 53 reported utilizing the hand hoe for this task. Only one person made use of a cultivator for weeding although he also used the hand hoe. No chemical herbicide use was reported. In the realm of insect and plant disease control, 36 persons (67,9%) reported carrying out this task. Although certainly weeding and pest control activities were not uncommon in Lesotho prior to 1979, it is felt that these elevated percentages reflect efforts by FSR and research agronomy and plant protection personnel through extension education programmes.

e. Animal ownership

Ownership of range animals showed 26 respondents (49,1%) owning sheep with a mean of 13 animals. Cattle were owned by 32 (60,4%) persons averaging six animals per owner. Other animal ownership was reported by 39 respondents (73,6%). A mean of six other animals per owner included goats, horses and donkeys.

Home-based animals included milk cows, swine and poultry. Mean milk cow ownership was three animals among 23 respondents (43,4%). The 20 persons (37,7%) who kept swine owned a mean of two pigs each. Poultry were kept by 43 respondents (81,1%) who owned a mean 10 birds apiece. Presumably these were mainly indigenous chickens.

f. Farm labour

In 49 cases (92,5%) members of respondents' families worked on their farms yielding a mean of three family members per household. Yet 23 respondents (43,4%) hired outside farm labour during the year. The incidence of herd boys among respondent households numbered 29 (54,7%) of whom 19 (65,5%) were family members and 10 (34,5%) were non-members.

g. Marketing

Of 53 respondents, 25 (47,2%) produced more goods than their families and animals consumed. Among such goods were beans, maize, wheat, peas, sorghum, cabbage, carrots and potatoes. These goods were actively marketed. Most farmers sold goods locally for cash. Bartering other goods for wheat was done by two persons, and one marketed surpluses through a local trader.

h. Farm records

Among the 53 respondents, seven (13,2%) kept farm records. No extension education effect is inferred here since the farm records programme is a different FSR activity.

3.6.3 Extension education indicators

Respondents were asked to provide certain feedback indicators in order to guide current and future extension education programme planning.

a. Farmer field day attendance

In addition to attendance at farmer education courses, respondents were asked if they had attended one of the three farmer field days held in the prototype areas during the scope of this study. Attending these field days were 45 of 54 persons, representing an 83,3% positive response to this extension method. There were two non-responses to the question, and seven persons (13%) did not attend farmer field days.

b. Radio programmes

The sample farmers were asked if they regularly listened to the FSR radio programme broadcast by the Research Division each Saturday morning. Radio programmes were regularly or frequently heard by 41 of 54 persons, a 75,9% positive response to this extension method. Radio programmes were not heard by 13 persons (24,1%). Those who did not listen said they did not own a radio, or that the programmes were too early in the morning.

Respondents who said they listened to the radio programmes were further asked if they liked to learn by radio. All respondents replied positively, provisionally reinforcing the extension potential in radio programming.

c. Validation of content recall

As extension education programmes were described to respondents during the interview process, a function designed to stimulate recall (Bennett, 1982), they were asked to indicate the accuracy of the programme description with respect to content. All 54 respondents said the descriptions were accurate so far as they knew, the maximum response on a four-point Likert scale. Although the lack of variability in the response may raise some question, the utility of that aspect of the questionnaire/interview process is nonetheless confirmed.

d. Reaction level

On the occasion of the personal interview, respondents were asked to what extent the extension education activities met their expectations at the time. Without exception, they replied that they had done so to a great extent, again a maximum response on a four-point Likert scale (Bennett, 1982). Regardless of some expected bias, the response still speaks well for suggestive programme effectiveness at the reactions evidence level (Bennett, 1980).

e. Methods preference

Since the extension education programmes from 1979 - 1984 incorporated a number of extension methods including illustrated talks, demonstrations, field trip/field days, and combinations of these, respondents were asked to indicate their method preferences. The illustrative talk was preferred by three persons (5%). The demonstration was preferred by one person (2%). Field trip/field days was indicated by one person (2%). A combination of methods was preferred by 47 respondents (87%), while two respondents (4%) did not reply. Since it has already been seen that radio programmes were also widely accepted, indications are that an integrated, multi-sensory approach to extension education in Lesotho is the course of action preferred by the farmers themselves. This finding is consistent with farming systems research and extension dynamics as they have evolved.

f. Venue of extension education

Since extension education programmes among members of farmer contact groups had taken place at the farmer training centres (FTC's) in Mokhotlong, Matela and Mohale's Hoek, and since they had abruptly been shifted to the field research centres (FRC's) at Molumong, Nyakosoba and Siloe upon the completion of those centres, it became necessary to determine the net effect of that change of venue. Thus, respondents were asked to indicate their preferences. Farmer training centres were preferred by four persons (7,4%). Field research centres were preferred by 50 persons (92,6%).

The overwhelming preference for the field research centres was qualified by three personal reasons on the part of the farmers. The desirability of being able to attend to family, animals and other farm matters each day before and after educational activities was stated by 42 respondents (84%). That more farmers could attend courses at field research centres was indicated by six respondents (11,1%), and that too much farmer assistance money had to be spent at farmer training centres was felt by two persons (3,7%). These reasons centered predominantly on concern for daily welfare of family and farm, concern that extension education reach more members of the farming community, and a sense of stewardship for public expenditure.

Those four (7,4%) persons who preferred the farmer training centres, gave as reasons the orderliness of classes and absence of confusion (3,7%), to see new places and work at the FTC (1,9%), and ability to listen and study more effectively (1,9%).

While this finding may not be good news for proponents of farmer education at the farmer training centres, it is nonetheless apparently clear that farmers themselves (92,6%) prefer extension education which takes place near their places of residence and do not want to be away from home overnight.

This finding, in addition to the vote of confidence for radio, speaks currently for localized extension programmes. This is consistent with the site-specific tenet of farming systems research and with FSR extension education as it has evolved. It also compliments the wisdom of the former director of agricultural research and current director of technical services in Lesotho who actively promoted the change of venue in question.

g. Recommendations by farmer contact groups (VAC) members

It is always a principle with FSR extension personnel to elicit feedback and recommendations from farmers on extension education programmes with a view toward improving programme effectiveness. Thus, all members of farmer contact groups who were interviewed were asked what suggestions they had for the improvement of the Research Division's farmer education programmes.

Tabulation shows that 44 persons (81,5%) had no suggestions or recommendations. This is seen as a socio-cultural phenomenon whose roots are outside the scope of this study. However, 10 persons (18,5%) gave recommendations which may be significant despite their infrequency. There were two suggestions that extension courses be brought to the village level since even the field research centre was distant from some respondents' houses. There was one recommendation each that more education be given on village agricultural committee (farmer contact group) responsibilities, animal management and range, plant protection, agronomy and dairy science.

One person felt there should be more practicals in farmer education, and one lodged a legitimate if perhaps misdirected request for a local inputs depot. A single respondent preferred lunch and snacks to tea!

3.6.4 KASA and practice change results*

Since the impacts of extension education programmes are ultimately measured in terms of behavioural change among clients, it is in order to analyze the data gathered from the 54 person sample of members of farmer contact groups on reflective self perceived changes in their own knowledge, attitudes, skills, aspirations and agricultural practices related to their involvement in farming systems research extension programmes.

a. KASA change

Members of the sample responded to standardized questions about the changes in knowledge, attitudes, skills and aspirations (KASA), and practice in the areas of agronomy, horticulture, plant protection, farm machinery, and animal and range management perceived as related to participation in extension programmes. Their responses on a standardized response Likert scale (Bennett, 1982) were as follows:

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* Care is to be exercised in interpreting results because of potential influence of extraneous factors.

- to a great extent (3)
- to a fair extent (2)
- to a slight extent (1)
- not at all (0)
- other (Z)

The values in parentheses were used by the research assistant (interviewer) to encode and record the responses onto a numerical matrix. The matrix values were then coded and entered into the computer by a second research assistant for compilation and analysis. The data to be discussed are the results of this process, and may be seen on Table 3.2

The KASA change values are retained in separate change components in order to insure the distinguishability of response value categories. Thus, one is able to determine from the data the percentage and number of respondents who reported gaining knowledge to a great extent (3) in agronomy as a result of their participation in extension education programmes during the period under study. Likewise, one can easily see the number and percentage of those who said they

TABLE 3.2: TOTAL CHANGES IN KNOWLEDGE, ATTITUDE SKILLS, ASPIRATIONS AND PRACTICE CHANGE BY 54 RESPONDENTS IN AGRONOMY, HORTICULTURE, PLANT PROTECTION, FARM MACHINERY AND ANIMAL AND RANGE MANAGEMENT, AS A RESULT OF EXTENSION EDUCATION PROGRAMMES 1979 - 1984, LESOTHO, 1985

		NUMBER OF RESPONDENTS					TOTAL RESP	PERCENTAGES				
		Z	0	3	2	1		Z	0	3	2	1
TOTAL AGR	KNOW	2	0	46	6	0	54	4	0	85	11	0
	ATT	2	0	46	6	0	54	4	0	85	11	0
	SKILL	2	0	40	12	0	54	4	0	74	22	0
	ASP	2	0	48	4	0	54	4	0	89	7	0
	PR/CH	2	6	33	10	3	54	4	11	61	19	6
TOTAL HORT	KNOW	1	0	48	5	0	54	2	0	89	9	0
	ATT	1	0	50	3	0	54	2	0	93	6	0
	SKILL	2	0	39	13	0	54	4	0	72	24	0
	ASP	1	0	50	3	0	54	2	0	93	6	0
	PR/CH	1	9	30	11	3	54	2	17	56	20	6
TOTAL PL/PROT	KNOW	2	0	43	7	2	54	4	0	80	13	4
	ATT	1	0	46	6	1	54	2	0	85	11	2
	SKILL	2	1	24	9	18	54	4	2	44	17	33
	ASP	1	2	41	7	3	54	2	4	76	13	6
	PR/CH	1	17	13	13	10	54	2	31	24	24	19
TOTAL FRM/MC	KNOW	4	1	41	7	1	54	7	2	76	13	2
	ATT	2	1	44	6	1	54	4	2	81	11	2
	SKILL	4	0	23	13	14	54	7	0	43	24	26
	ASP	2	1	46	4	1	54	4	2	85	7	2
	PR/CH	2	11	13	20	8	54	4	20	24	37	15
TOTAL ANI/MGT	KNOW	3	0	44	7	0	54	6	0	81	13	0
	ATT	2	0	46	6	0	54	4	0	85	11	0
	SKILL	3	0	26	17	8	54	6	0	48	31	15
	ASP	2	1	44	6	1	54	4	2	81	11	2
	PR/CH	2	31	2	10	9	54	4	57	4	19	17

Z = OTHER

0 = NOT AT ALL

3 = TO A GREAT EXTENT

2 = TO A FAIR EXTENT

1 = TO A SLIGHT EXTENT

learned plant protection skills to a slight extent (1), or those who experienced no practice change (0) in animal and range management.

Generally, the data tentatively support indication of positive KASA changes, tending provisionally toward change to a great extent in all technical agriculture subject matters as a result of having participated in farming systems research extension education programmes from 1979 - 1984, as perceived by the members of farmer contact groups themselves.

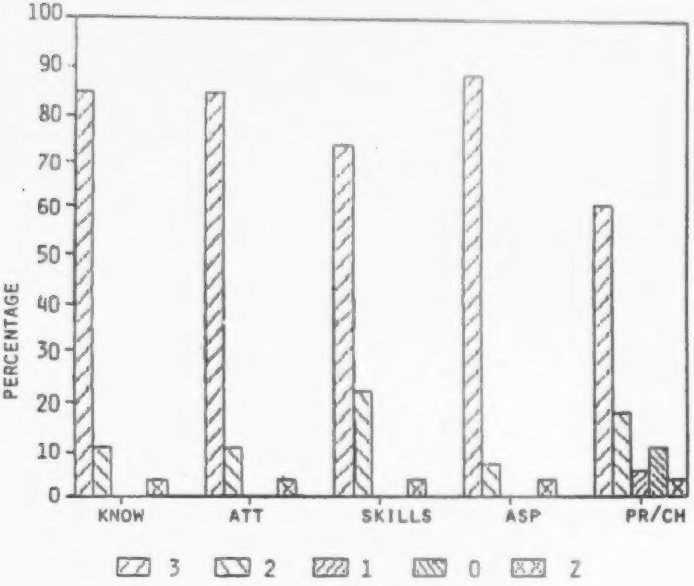
b. Practice change

In the practice change arena, the results of the extension education programmes through farming systems research are tentatively positive and suggest having exceeded the target adoption rate of 5 per cent stipulated in the Farming Systems Research Project Paper for the prototype areas. Since KASA change is prerequisite to practice change, it is only fair to say that it is also easier to achieve. The incentives of a mono-cash cultivation scheme and/or coercion are the only exceptions to that statement which come to mind. It is expected that practice change will happen to a lesser degree and with greater variability than KASA change, and one can expect many constraints to practice change which are beyond the control and even the influence of the extension educator.

So too, the factors that inhibit practice change are of high variability in their relative costs and consequences. For example, it is less costly, more simple, less risky and grossly less time consuming to adopt a new Safim planter shoe than it is to dramatically cull a herd of cattle or decide to grow fodder instead of grain. It is easier to plant a new variety of wheat than it is to make a significant change in range management. In all subject matter areas there are non-adopters. This is so the world over, to far more serious degrees than reported in Lesotho.

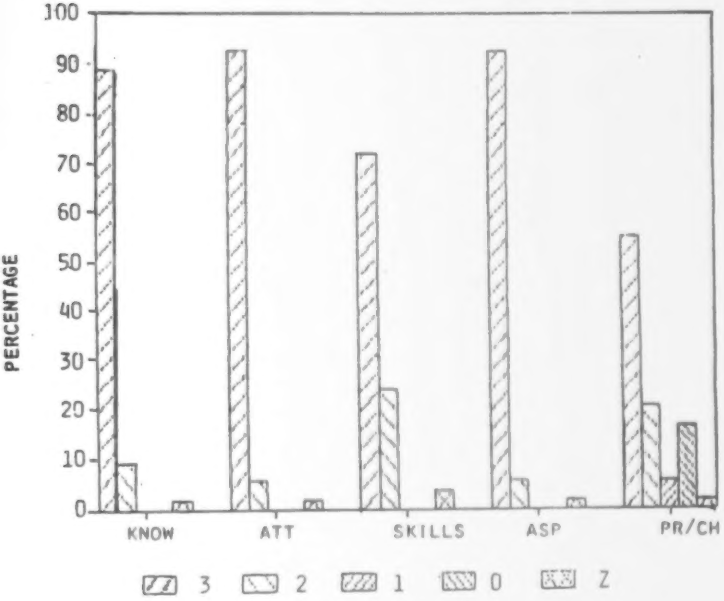
The data on practice change, given the above qualifications, are encouraging. The highest degree of suggested practice change is found in agronomy, followed by horticulture, farm machinery, plant protection, and animal and range management in that order and that change was related to extension education by the respondents themselves. These data may be seen graphically in Figures 3.2, 3.3, 3.4, 3,5 and 3.6.

FIGURE 3.2: KASA AND PRACTICE CHANGE IN AGRONOMY, LESOTHO, 1985



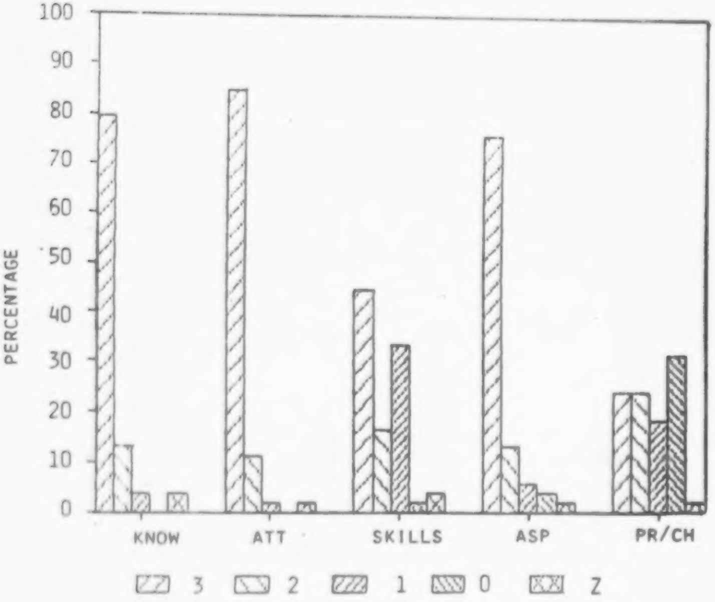
3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

FIGURE 3.3: KASA AND PRACTICE CHANGE IN HORTICULTURE, LESOTHO, 1985



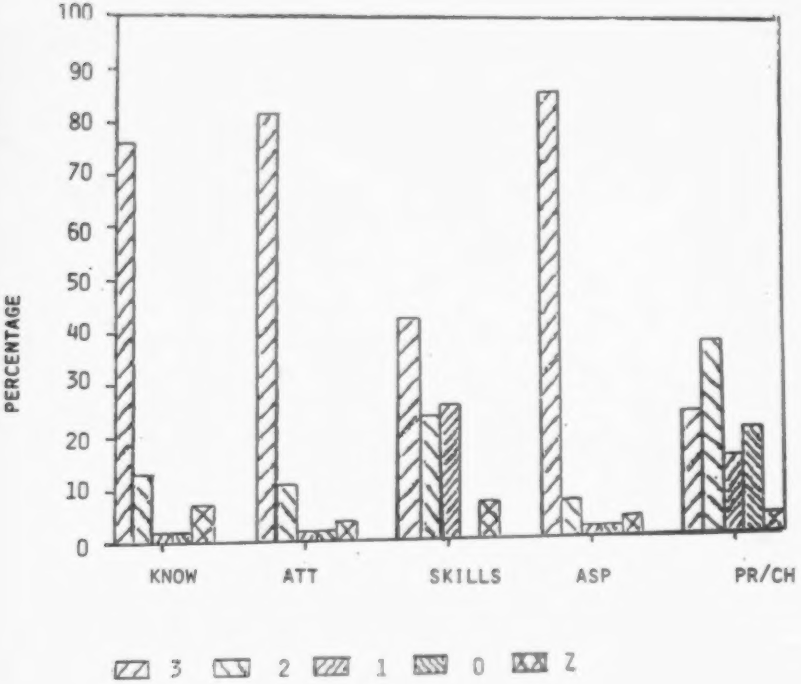
3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

FIGURE 3.4: KASA AND PRACTICE CHANGE IN PLANT PROTECTION, LESOTHO, 1985



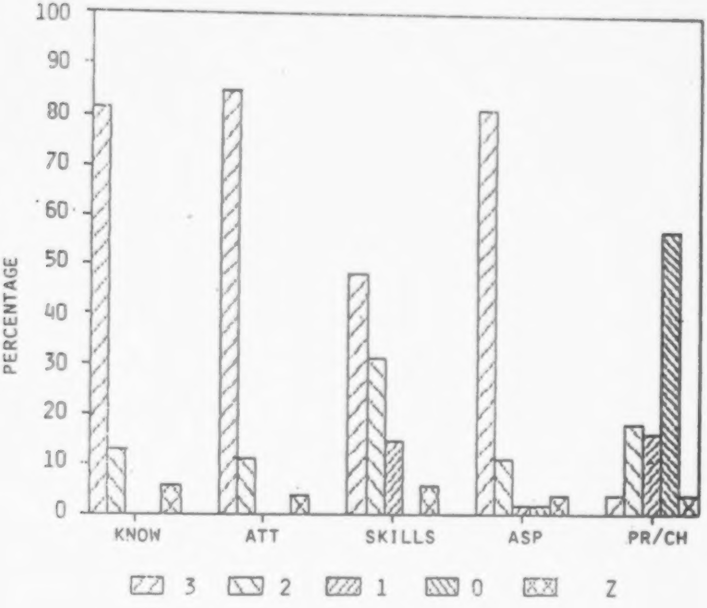
3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

FIGURE 3.5: KASA AND PRACTICE CHANGE IN FARM MACHINERY, LESOTHO, 1985



3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

FIGURE 3.6: KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT, LESOTHO, 1985



3 = TO A GREAT EXTENT

2 = TO A FAIR EXTENT

1 = TO A SLIGHT EXTENT

0 = NOT AT ALL

Z = OTHER

(c) KASA change and intensity of extension education:

When KASA data are related to the number of short courses each respondent attended, a slightly different configuration emerges, which may be seen in Tables 3.3, 3.4, 3.5 and 3.6. There were five respondents who had attended a single course, 17 who attended two courses, 18 who attended three courses, and 14 who had been to all four courses. The KASA scores commence high with little variability among the participants in the first courses. Responses appear to remain rather high but gain variability as people benefit from having attended two farmer education courses. KASA values for respondents attending three courses seem to gain in cumulative strength and also in variability. Respondents attending all four courses report very high KASA scores and variability decreases. That is, quality of learning seems to increase together with intensity of extension education. This trend prevails in all agricultural subject matters.

Although, as expected, cumulative practice change lags somewhat behind cumulative KASA change, the practice change results configuration with intensity of extension education appears to increase steadily. This can be seen, with minor fluctuations, in all agricultural subject matters. There is some reason to believe that these indicative gains in practice change are associated provisionally with parallel

TABLE 3.3: KASA AND PRACTICE CHANGES FOR RESPONDENTS ATTENDING ONE EXTENSION EDUCATION COURSE, LESOTHO, 1985

		TOTAL RESPOND (5)					PERCENTAGES				
COURSE 1		Z	0	3	2	1	Z	0	3	2	1
AGR	KNOW	1	0	4	0	0	20	0	80	0	0
	ATT	1	0	3	1	0	20	0	60	20	0
	SKILL	1	0	4	0	0	20	0	80	0	0
	ASP	1	0	4	0	0	20	0	80	0	0
	PR/CH	1	1	2	1	0	20	20	40	20	0
HORT.	KNOW	1	0	4	0	0	20	0	80	0	0
	ATT	1	0	4	0	0	20	0	80	0	0
	SKILL	1	0	3	1	0	20	0	60	20	0
	ASP	1	0	4	0	0	20	0	80	0	0
	PR/CH	1	2	2	0	0	20	40	40	0	0
PL/PROT	KNOW	1	0	4	0	0	20	0	80	0	0
	ATT	1	0	3	1	0	20	0	60	20	0
	SKILL	1	0	3	0	1	20	0	60	0	20
	ASP	1	0	3	0	1	20	0	60	0	20
	PR/CH	1	2	1	1	0	20	40	20	20	0
FRM/MC	KNOW	1	0	4	0	0	20	0	80	0	0
	ATT	1	0	4	0	0	20	0	80	0	0
	SKILL	1	0	3	1	0	20	0	60	20	0
	ASP	1	0	3	0	1	20	0	60	0	20
	PR/CH	1	2	1	1	0	20	40	20	20	0
ANI/MGT	KNOW	1	0	4	0	0	20	0	80	0	0
	ATT	1	0	3	1	0	20	0	60	20	0
	SKILL	1	0	4	0	0	20	0	80	0	0
	ASP	1	0	4	0	0	20	0	80	0	0
	PR/CH	1	3	0	1	0	20	60	0	20	0

Z = OTHER
0 = NOT AT ALL
3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT

TABLE 3.4: KASA AND PRACTICE CHANGES FOR RESPONDENTS ATTENDING TWO EXTENSION EDUCATION COURSES, LESOTHO, 1985

		TOTAL RESPOND (17)					PERCENTAGES				
COURSE2		Z	0	3	2	1	Z	0	3	2	1
AGR	KNOW	0	0	13	4	0	0	0	76	24	0
	ATT	0	0	13	4	0	0	0	76	24	0
	SKILL	0	0	13	4	0	0	0	76	24	0
	ASP	0	0	14	3	0	0	0	82	18	0
	PR/CH	0	4	6	5	2	0	24	35	29	12
HORT	KNOW	0	0	14	3	0	0	0	82	18	0
	ATT	0	0	14	3	0	0	0	82	18	0
	SKILL	1	0	11	5	0	6	0	65	29	0
	ASP	0	0	15	2	0	0	0	88	12	0
	PR/CH	0	4	4	8	1	0	24	24	47	6
PL/PROT	KNOW	1	0	13	3	0	6	0	76	18	0
	ATT	0	0	13	4	0	0	0	76	24	0
	SKILL	1	1	6	4	5	6	6	35	24	29
	ASP	0	0	11	6	0	0	0	65	35	0
	PR/CH	0	8	1	6	2	0	47	6	35	12
FRM/MC	KNOW	3	0	10	4	0	18	0	59	24	0
	ATT	1	0	14	2	0	6	0	82	12	0
	SKILL	3	0	4	4	6	18	0	24	24	35
	ASP	1	0	14	2	0	6	0	82	12	0
	PR/CH	1	2	2	7	5	6	12	12	41	29
ANI/MGT	KNOW	2	0	10	5	0	12	0	59	29	0
	ATT	1	0	12	4	0	6	0	71	24	0
	SKILL	2	0	4	6	5	12	0	24	35	29
	ASP	1	0	12	4	0	6	0	71	24	0
	PR/CH	1	7	0	6	3	6	41	0	35	18

Z = OTHER
0 = NOT AT ALL
3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT

TABLE 3.5: KASA AND PRACTICE CHANGES FOR RESPONDENTS ATTENDING THREE EXTENSION EDUCATION COURSES, LESOTHO, 1985

		TOTAL RESPOND (18)					PERCENTAGE				
COURSE3		Z	0	3	2	1	Z	0	3	2	1
AGR	KNOW	1	0	15	2	0	6	0	83	11	0
	ATT	1	0	16	1	0	6	0	89	6	0
	SKILL	1	0	13	4	0	6	0	72	22	0
	ASP	1	0	16	1	0	6	0	89	6	0
	PR/CH	1	0	15	2	0	6	0	83	11	0
HORT	KNOW	0	0	16	2	0	0	0	89	11	0
	ATT	0	0	18	0	0	0	0	100	0	0
	SKILL	0	0	12	6	0	0	0	67	33	0
	ASP	0	0	17	1	0	0	0	94	6	0
	PR/CH	0	3	12	1	2	0	17	67	6	11
PL/PROT	KNOW	0	0	14	2	2	0	0	78	11	11
	ATT	0	0	16	1	1	0	0	89	6	6
	SKILL	0	0	5	3	10	0	0	28	17	56
	ASP	0	2	13	1	2	0	11	72	6	11
	PR/CH	0	6	3	3	6	0	33	17	17	33
FRM/MC	KNOW	0	1	14	2	1	0	6	78	11	6
	ATT	0	1	13	3	1	0	6	72	17	6
	SKILL	0	0	7	5	6	0	0	39	28	33
	ASP	0	1	16	1	0	0	6	89	6	0
	PR/CH	0	4	4	8	2	0	22	22	44	11
ANI/MGT	KNOW	0	0	16	2	0	0	0	89	11	0
	ATT	0	0	17	1	0	0	0	94	6	0
	SKILL	0	0	8	8	2	0	0	44	44	11
	ASP	0	1	14	2	1	0	6	78	11	6
	PR/CH	0	14	0	2	2	0	78	0	11	11

Z = OTHER
0 = NOT AT ALL
3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT

TABLE 3.6: KASA AND PRACTICE CHANGES FOR RESPONDENTS ATTENDING FOUR EXTENSION EDUCATION COURSES, LESOTHO, 1985

		TOTAL RESPOND (14)					PERCENTAGES				
COURSE4		Z	0	3	2	1	Z	0	3	2	1
AGR	KNOW	0	0	14	0	0	0	0	100	0	0
	ATT	0	0	14	0	0	0	0	100	0	0
	SKILL	0	0	10	4	0	0	0	71	29	0
	ASP	0	0	14	0	0	0	0	100	0	0
	PR/CH	0	1	10	2	1	0	7	71	14	7
HORT	KNOW	0	0	14	0	0	0	0	100	0	0
	ATT	0	0	14	0	0	0	0	100	0	0
	SKILL	0	0	13	1	0	0	0	93	7	0
	ASP	0	0	14	0	0	0	0	100	0	0
	PR/CH	0	0	12	2	0	0	0	86	14	0
PL/PROT	KNOW	0	0	12	2	0	0	0	86	14	0
	ATT	0	0	14	0	0	0	0	100	0	0
	SKILL	0	0	10	2	2	0	0	71	14	14
	ASP	0	0	14	0	0	0	0	100	0	0
	PR/CH	0	1	8	3	2	0	7	57	21	14
FRM/MC	KNOW	0	0	13	1	0	0	0	93	7	0
	ATT	0	0	13	1	0	0	0	93	7	0
	SKILL	0	0	9	3	2	0	0	64	21	14
	ASP	0	0	13	1	0	0	0	93	7	0
	PR/CH	0	3	6	4	1	0	21	43	29	7
ANI/MGT	KNOW	0	0	14	0	0	0	0	100	0	0
	ATT	0	0	14	0	0	0	0	100	0	0
	SKILL	0	0	10	3	1	0	0	71	21	7
	ASP	0	0	14	0	0	0	0	100	0	0
	PR/CH	0	7	2	1	4	0	50	14	7	29

Z = OTHER
0 = NOT AT ALL
3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT

gains in KASA change, and that both kinds of change are potentially produced by extension education programmes of increasing intensity.

(d) The "Z" response

Although a number of respondents made use of the "z" response, its significance in most cases was non-specific. The category was made available on the questionnaire for those persons who felt they could not respond honestly or accurately to a given question with a 3,2,1 or 0 reply. Only modest use was made of the "Z" response. From the sparse information available, it appears that the few persons using "Z" did so to indicate such conditions as "not applicable", "don't remember", or some other intervening or prevailing situation. The "Z" response is not seen to have had a significant effect on the pattern of KASA and practice change data.

(e) Examples of practice change

No attempt was made to compile or tabulate data on the nature of the vast array of indicated practice change. It was considered sufficient to link reported practice change to the five agricultural subject matter areas. Researchers from those disciplines are invited to relate cumulative practice change to the nature of subject matter taught, to gain some insight into practice change differentiation. A subsequent analysis of end results will also bear some inference to differentiation of such change.

In the meantime, it is important to note that an "open-end probe question" section constituted an important component of the interview questionnaire. Its purpose was to allow the interviewer, at her discretion, to make use of probe questions to explain, elucidate or confirm any response deemed necessary. The probe questions in practice were used to gain more information about positive responses as well as to understand negative responses. Responses to the questions do render a variety of information about the nature of practice change. Although no attempt is made in this study to quantify all this information, it is useful to examine some examples.

Farmer 3 said she is using organic manure and is getting higher yields. Farmer 9 said she now knows how to make a seedbed, she made one this year and used manure from the compost heap she also made. Farmer 9 also set aside a place for grazing milk cows. Farmer 13 said she stored enough maize to feed her family, she had never done that before but rather had to purchase maize meal in small packets from the shop. Farmer 14 reported that she used certified seed and fertilizer and carried out all the steps to have a good crop, she also learned how to make a good seedbed and compost heap and did so in her garden. Farmer 19 reported using cutworm bait and had good maize.

Farmer 21 said she is doing winter ploughing and is getting better yields. Farmer 30 said she is now planting improved seeds and she uses fertilizer*. Farmer 34 said she winter ploughed her fields and used a planter. Farmer 43 said he used fertilizer and bought certified seed; because of this his yields increased from 5 bags to 12 bags. Farmer 47 said he bought ox-drawn equipment**. Farmer 48 said he is now planting recommended varieties of vegetables. Farmer 50 said he was able to use Safterex and did not have problems from cutworm.

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* Nyakosoba farmers purchased improved maize seed varieties PNR 473, PNR 493 and SSM 2043; sorghum seed PNR 8311; and recommended 2-3-0 (21) fertilizer.

** Recommended Areana ox-drawn machinery is being bought by farmers.

Farmer 51 reports he now has an irrigation system and can produce vegetables all the year round*. Though these comments not exhaustive, they represent a balanced description of practice changes actually made.

(f) Constraints to practice change

Information about constraints to practice change is more plentiful since it derives from two data sources. First, the very same "open-end probe question" facility which produced so many of the above comments on positive practice change also rendered a great deal of commentary about constraints. Second, the questionnaire met the constraint question squarely with its Question 12 which asked the respondent if there were changes he/she really wanted to make on his/her farm but was unable to make and if so, to please explain why.

Commentary is abundant but variability is less pronounced. Thus, it becomes possible to quantify these data, at least in terms of cumulative responses.

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* Vegetables were marketed commercially in Nyakosoba and Siloe.

The constraint to constructive change in range management and improvement was that most voiced by the persons interviewed (35 respondents). The components of the constraint are that individual farmers are powerless to make a difference, that people don't care, that people won't cooperate in the conservation of a communal resource, and that collective range management will require vast public education.

The constraint to practice change next most frequently mentioned was the non-availability of personal finances to enable desired change. This was stated by 32 respondents. They said they required money to buy or expand into such things as feed, fruit trees, milk cows, poultry, seed, fertilizer, pigs, vegetable gardens, cattle, ox-drawn machinery and fodder. It can be seen that the need for finance embraces three activities, namely purchase of inputs, purchase of supplies, and mounting of new enterprises.

The non-availability of pesticides locally was voiced by 18 people and constituted the third most serious constraint to change as seen by respondents. Many said they know what plant diseases and insect pests they have but are not able to find the necessary pesticides.

Inadequate training is a grouped constraint to change representing the individual shortfalls of 14 persons who felt they needed more instruction in such areas as pesticide applications, farm machinery, fruit tree culture, poultry production, and animal management.

Pest and animal damage to growing crops was seen as a constraint to meaningful change by 13 persons. This observation involved both infestation of insects, disease, and hardy weeds as well as livestock grazing growing plants.

Lack of resources was another collective constraint to change mentioned by 13 persons who stated they wanted to do certain activities, but did not do so, for lack of such things as farm machinery, oxen, land and plastic.

Drought, or non-availability of irrigation water was stated as a constraint to change by 10 respondents.

It can be clearly seen that the constraints to practice change as perceived by members of farmer contact groups lie almost totally outside the scope of farming systems research and extension education dynamics. That is to say that even though farming systems research and extension successes have been suggested thus far in this study, it will still require a comprehensive and enforceable range conservation policy nationwide if significant breakthroughs against range degradation are to be achieved. If credit is not available to individual farmers nationwide, then investment in needed resources or new enterprises may not be widely made. If pesticides are not made available to farmers in remote areas in a timely way by the parastatal supply organization or private traders, then they will likely not be used to the desired degree to combat potential devastation by pests.

Drought is persistent in most of Africa during the current climatic cycle, and inadequacies in training expressed by a few respondents will continue to be addressed. They are few, however, compared to the promising KASA change results reported earlier.

It would appear that farming systems research extension education programmes achieved some potential successes among members of farmer contact groups in the areas of KASA and practice change during the 1979 - 1984 period. It must be remembered, however, that farming systems research and extension as a dynamic development strategy, does not operate in a vacuum.

The infrastructure conducive to agricultural development must be in place, credit must be attainable, inputs must be available, and markets must be developed and protected in order for farming systems research to have its maximum effect.

3.6.5 End results

Despite the constraints voiced above, there were indicative practice changes during 1979 - 1984 among members of farmer contact groups induced, according to their perceptions, through the extension education programmes of farming systems research. However, end results, otherwise termed real benefits to farmers, constitute the final measuring stick for determining the value of the farming systems research and extension intervention in Lesotho, and the concurrent adoption of the farming systems dynamic by the Research Division of the Ministry of Agriculture as its central operational philosophy. This study purports to elucidate those end results as the highest evidence level (Bennett 1976) in the context of change related to extension education programmes by participant farmers.

In consultation with research colleagues, several indicators were selected as factors to be determined in the assessment of real benefits (end results) of farming systems research to members of farmer contact groups as perceived by them to be related to extension education programmes.

The indicators* are (AA) more income from farming, (BB) more trading with neighbours, (CC) acquisition of more property, (DD) acquisition of better animals, (EE) stored and/or preserved food, (FF) better meals for family, (GG) better education for children, (HH) higher crop yields, (II) better condition of animals, (JJ) ability to purchase improved inputs, (KK) ability to secure credit/loans, (LL) improved farm records, (MM) better markets, (NN) other, and (OO) no significant benefits.

These indicators, while not exhaustive, are thought to be consistent with the stated objectives of the Farming Systems Research Project in Lesotho. Responses from the 54 persons in the farmer contact group were entered into the computer for tabulation and analysis, and the outcomes may be seen in Table 3.7 and Figure 3.7 for the total sample. Since the (NN) other and the (OO) no significant benefits categories had a 100 per cent non-response, they have been eliminated from the data.

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* Indicators are generally reflective of FSR objectives.

TABLE 3.7: END RESULTS (REAL BENEFITS) TO MEMBERS OF FARMER CONTACT GROUPS OF EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985

	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
0	39	43	15	39	67	80	43	65	50	50	0	17	37	0	0
1	57	52	81	56	31	19	39	31	37	44	93	44	9	0	0
2	0	0	2	4	0	0	11	2	7	2	0	33	15	0	0
3	4	6	2	2	2	2	7	2	6	4	7	6	39	100	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

0 = YES

1 = NO

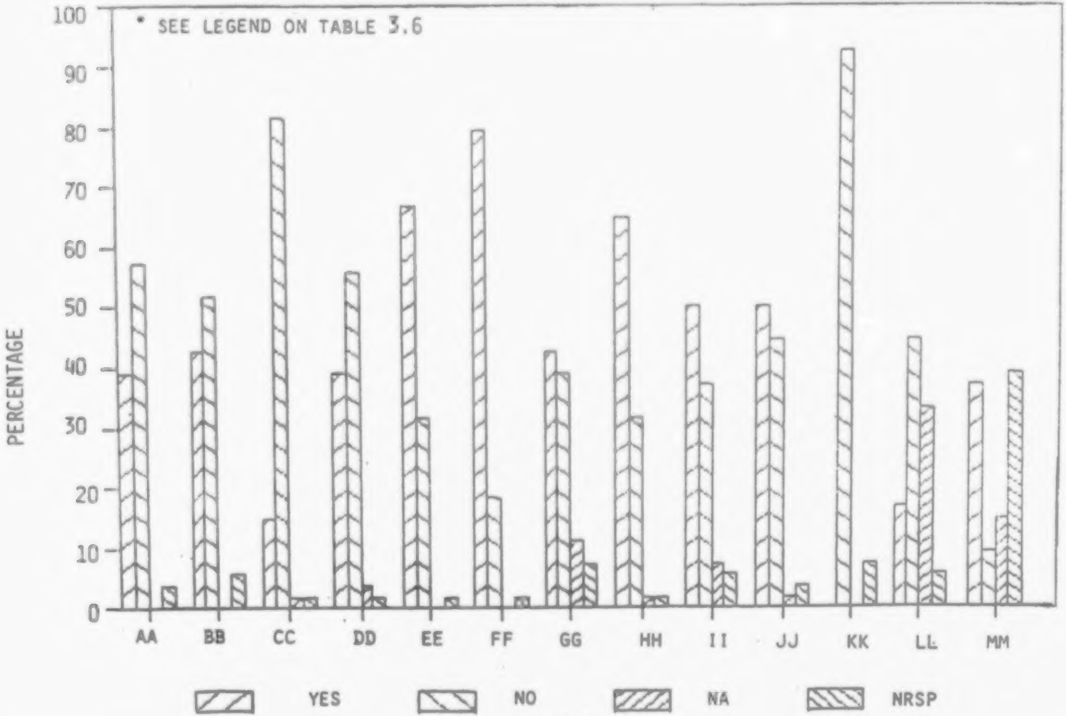
2 = NOT APPLICABLE

3 = NO RESPONSE

LEGEND TO END RESULTS TABLE AND GRAPHS

AA = MORE INCOME FROM FARMING
BB = MORE TRADING WITH NEIGHBOURS
CC = ACQUISITION OF MORE PROPERTY
DD = ACQUISITION OF BETTER ANIMALS
EE = STORED AND/OR PRESERVED FOOD
FF = BETTER MEALS FOR FAMILY
GG = BETTER EDUCATION FOR CHILDREN
HH = HIGHER CROP YIELDS
II = BETTER CONDITION OF ANIMALS
JJ = ABLE TO PURCHASE IMPROVED INPUTS
KK = ABLE TO SECURE CREDIT/LOANS
LL = IMPROVED FARM RECORDS
MM = BETTER MARKETS
NN = OTHER
OO = NO SIGNIFICANT BENEFITS

FIGURE 3.7: END RESULT (REAL BENEFIT) TO MEMBERS OF FARMER CONTACT GROUPS OF EXTENSION EDUCATION PROGRAMMES* LESOTHO, 1985



As can be seen, the most significant end result or real benefit reported by the total sample of members of farmer contact groups as perceived by them as related to farming systems research extension education programmes was (FF) better meals for family. It was reported as a benefit by 80% of the respondents and seems closely linked to the next most significant benefit (EE) stored and/or preserved food, reported by 67% of the respondents*. This finding is likely related to the nutrition and domestic management extension education programmes described in Section 3.2 in this chapter. The finding is also likely related to the high incidence of KASA and practice change in horticulture shown on Table 3.3 of this chapter since stored and preserved food and subsequent dietary improvements is thought to be related to home grown vegetables. Finally, the finding is probably sex specific since the extension education programme in nutrition and home economics was given only for women, and the majority of the respondents are likewise women.

The third most significant benefit, and the first which is not sex specific or sex influenced, is (HH) higher crop yields**, a finding reported by 65 per cent of the respondents. This is followed by (II) better condition of animals* and (JJ) able to purchase improved inputs, benefits each according to 50%. These three appear to be linked and are likely influenced as well by (AA) more income from farming which benefited 39% of the respondents, and (DD) acquisition of better animals accruing to 39% of the sample as well.

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* An important FSR objective.

** Farmers are using improved varieties of maize and sorghum seed, are cultivating pinto beans, and are applying recommended fertilizer.

The 43% of the sample who reported (BB) more trading with neighbours and the 37% who benefited from (MM) better markets are responsible for two more possibly related findings in which can be detected an apparent improvement in local means of disposing of surpluses. These findings may also be related to those reported in the 3.6.2 g section of this chapter where some of these marketing dynamics and the produce involved were discussed.

Finding (GG) better education for children at best is a desirable and positive benefit. Its direct relationship to farming systems research and extension is seen as tenuous although the awareness and cumulative educational "product" among parents probably has some influence. A few respondents who reported this benefit could not relate it to the farming systems research experience.

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* A "grazing lands at home" association of 76 farmers in Siloe are cultivating one hectare each of fodder to include fodder sorghum, barley, oats, rye, teff and others. Residents of one Nyakosoba village are practising rotational grazing on native pasture, and two Molumong villages are alternating fodders with range rest schemes.

Whatever impacts have derived from the farming systems research intervention in farm record keeping have not accrued significantly to members of the farmer contact groups, 17% of which reported (LL) improved farm records as benefit. It must be stated, however, that the farm records programme was conducted among a specifically identified group of clients and its outcomes are not being evaluated within the scope of this study. It must also be stated that neither farm records specifically nor farm management in general were prominent among the agricultural subject matter taught to farmers in the extension education programmes.

Also not among the significant benefits of the extension education programmes was (CC) acquisition of property, reported as a positive outcome by 15% of the sample. Of course, given the value of some property such as ox-drawn equipment, tools, etc., 15% may not be as insignificant as it seems.

A resounding non-benefit, and one reported by 93% of the sample and 7% non-respondents, was (KK) the ability to secure credit or loans. It is obvious that the provision and sustenance of credit and loans is not among the components of farming systems research philosophy and dynamics. It is, nonetheless, a helpful if temporary resource and mention has been made of the potential of farm credit. By the end of 1984, its procurement seems to have been beyond the capability of farmer contact group membership. This is a finding which is expected to change dramatically since farmer contact groups in Molumong and Nyakosoba were trained in cooperatives early that year; a condition which, among other things, qualified the membership for credit and loans through the Agricultural Development Bank*. But, those events are beyond the scope of this study.

Thus, it can be seen that perceived benefits have accrued to members of the farmer contact groups as a result of having participated in a variety of extension education programmes within the context of farming systems research. Provisionally, as in the case of KASA and practice change analysis, these data analyzed on the basis of those respondents attending one, two, three and four extension courses, produce a similar pattern of indicative growth in percentage benefits with increased intensity of extension education. This "extension effect" may be seen in Table 3.8. The evidence certainly suggests that real benefits to farmers, along with associated gains in KASA and practice change can be achieved through concentration of effort on extension programmes.

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* Nyakosoba farmer cooperative members borrowed R6 154,58 in 1986 from ADB and purchased improved maize and sorghum seed and recommended fertilizer from Coop Lesotho.

TABLE 3.8: GROWTH IN REAL BENEFITS TO FARMERS WITH INTENSITY OF EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985

PERCENTAGE RESPONSE FOR ONE COURSE

	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
0	40	60	0	20	40	60	20	40	20	40	0	0	40	0	0
1	60	40	100	80	60	40	60	60	60	40	100	80	0	0	0
2	0	0	0	0	0	0	20	0	0	0	0	0	20	0	0
3	0	0	0	0	0	0	0	0	20	20	0	20	40	100	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

PERCENTAGE RESPONSE FOR TWO COURSES

	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
0	24	29	6	53	65	82	35	53	53	35	0	18	24	0	0
1	71	65	94	41	35	18	35	47	47	65	94	59	6	0	0
2	0	0	0	6	0	0	18	0	0	0	0	24	24	0	0
3	6	6	0	0	0	0	12	0	0	0	6	0	47	100	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

PERCENTAGE RESPONSE FOR THREE COURSES

	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
0	44	44	17	33	78	83	44	83	50	61	0	11	39	0	0
1	56	50	78	61	22	17	44	11	33	33	94	28	11	0	0
2	0	0	6	6	0	0	11	6	17	6	0	61	11	0	0
3	0	6	0	0	0	0	0	0	0	0	6	0	39	100	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

PERCENTAGE RESPONSE FOR FOUR COURSES

	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
0	50	50	29	36	64	79	57	64	57	57	0	29	50	0	0
1	49	43	64	57	29	14	29	29	21	36	86	36	14	0	0
2	0	0	0	0	0	0	0	0	7	0	0	21	7	0	0
3	7	7	7	7	7	7	14	7	14	7	14	14	29	100	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

AA = MORE INCOME FROM FARMING
BB = MORE TRADING WITH NEIGHBOURS
CC = ACQUISITION OF MORE PROPERTY
DD = ACQUISITION OF BETTER ANIMALS
EE = STORED AND/OR PRESERVED FOOD
FF = BETTER MEALS FOR FAMILY
GG = BETTER EDUCATION FOR CHILDREN
HH = HIGHER CROP YIELDS
II = BETTER CONDITION OF ANIMALS
JJ = ABLE TO PURCHASE IMPROVED INPUTS
KK = ABLE TO SECURE CREDIT/LOANS
LL = IMPROVED FARM RECORDS
MM = BETTER MARKETS
NN = OTHER
OO = NO SIGNIFICANT BENEFITS

3.6.6 Farmer contact groups as an innovations diffusion network

Farmer contact groups were organized, not only as target audiences for extension education programmes, but also as components of an innovations diffusion network. It was felt that a few cooperating farmers, on whose lands on-farm research and demonstrations were to be conducted, would likely adopt recommended crops and practices generated by such joint activity. It seemed logical as well that farmer contact group members, the target of intensive extension education, would be prone to positive growth in KASA and practice change (adoption). If such desired adoption was to happen on a wider front, however, it was seen that farmer contact groups would have to perform a great deal of dissemination of information among other farmers. They would be expected to constitute, as it were, an innovations diffusion network, and individual members would be expected to tell other farmers about new information and practices, show other farmers live examples of innovations, and actually encourage and facilitate observation by others of new or different things happening on their farms. Such activity would result in a "multiplier effect", it was intended, and the multiplier effect in turn would enhance the probability of adoption of innovations on a wider front. Thus, from the beginning, farmer contact groups were educated on their roles and responsibilities with special emphasis on dissemination and diffusion. How well this was accomplished is indicated by the following analysis.

At the time of the personal interviews with members of the sample, respondents were asked how many other farmers they had told about new agricultural information and practices, how many they had showed how to farm in better ways, and how many they thought had learned better farming methods by observing what members did on their own farms. A simple compilation of these data show the potential effectiveness of the 54 respondents, as seen on Table 3.9.

When respondents are grouped according to age interval and farming experience, some interesting patterns begin to emerge. For example the total sample of 54 respondents collectively told 842 persons about agricultural innovations, a multiplier* effect of 15.6 in the "told" category. Those same 54 persons showed 315 others new or different things on their farms, yielding a multiplier of 3.8. Finally, the 54 respondents estimated that 268 other farmers had observed innovations on their farms, a multiplier of roughly 5. It is evident that the largest number of respondents was in the 41 - 50 age interval yielding 39% of the total number of respondents. At the

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* Multipliers are derived by dividing the people reached in each mode by the number of respondents.

TABLE 3.9: DIFFUSION EFFECTIVENESS OF INDIVIDUAL RESPONDENTS, LESOTHO, 1985

	BIO.DATA								
UEST. NO	AGE	SEX	AREA	YRS/FRM	EDUC(Std)	MIG/RSA	TOLD	SHOWED	OBSERVED
1	42	Female	Nyakosoba	15	5	1	35	6	10
2	48			37	2	1	16	6	4
3	62			14	7	6	8	3	10
4	36			6	6	0	10	5	6
5	47			24	6	1	20	0	5
6	42			11	5	1	30	10	3
7	59			25	1	0	15	2	4
8	42				1	3	15	2	8
9	30			5	6	1	10	5	0
10	71			30	1	0	30	20	5
11	50			20	6	3	5	1	2
12	50			20	3	1	25	15	5
13	55			15		5	30	3	5
14	31			5	4	1	10	4	4
15	43			10	5	1	30	11	10
16	50			20	5	1	35	20	15
17	45			5	3	1	40	7	20
18	40			13	3	1	8	3	0
19	32	Female	Siloe	4	4	3	6	1	0
20	27			7	7	2	2	3	1
21	40			12	4	0	4	3	2
22	55			3	6	2	2	3	2
23	28			2	7	1	15	1	1
24	48			14	3	1	10	5	8
25	48			25	1	2	25	3	2
26	69			4	2	0	0	0	0
27	52			10	2	1	10	6	6
28	39			0	4	4	0	0	0
29	56			31	5	1	0	0	0
30	34			6	3	8	25	0	5
31	42			12	3	2	2	0	0
32	30			2	7	4	30	11	11
33	35			5	4	1	2	1	1
34	48			5	6	4	20	6	3
35	43			12	7	0	7	7	6
36	21	Female	Molumong	5	7	1	20	4	5
37	45			27	6	0	20	19	4
38	31			3	4	1	10	4	4
39	62			36	4	3	5	2	2
40	24			6	6	6	15	2	0
41	62			36	4	3	5	2	2
42	55	Male	Nyakosoba	39	0	1	25	12	7
43	50			25	0	1	30	20	20
44	50			20	0	2	25	13	20
45	51	Male	Molumong	20	2	0	10	0	5
46	59			12	1	2	50	3	5
47	65			35	0	1	10	0	0
48	49	Male	Siloe	14	0	0	15	8	8
49	39			3	5	0	2	2	3
50	64			46	5	4	4	1	1
51	48			4	1	3	25	20	4
52	47			12	3	0	30	25	10
53	70			20	1	2	5	3	3
54	58			12	5	1	4	2	1

same time, they were responsible for telling 460 (55%), showing 204 (65%), and facilitating observation by 167 (62%) non-members of agricultural innovations. Yet, with 30 years cumulative farming experience (roughly 4%) they appear to have performed beyond expectation. Why this age group, despite being so numerous, has so little farming experience is an interesting question not answered by this analysis. Data for other age and farming experience groups may be seen on Table 3.10.

This phenomenon can likewise not be explained by analysis of the data at hand.

The suggestion is that farmer contact groups appear to have been effective disseminators of agricultural information and diffusors of innovations. The 54 persons in the sample told 842 persons, showed 315 persons, and facilitated the observation by 268 persons of agricultural innovations. If that yields a mean multiplier effect of 8,8 for all diffusion forms analyzed, and if that mean multiplier factor is extended to all 224 farmers holding contact group membership, it is possible that farmer contact group members have diffused innovation deriving from farming systems research to nearly 2000 persons during the period under study. Actual adoption rates among that population cannot be determined from the current data.

TABLE 3.10: DIFFUSION EFFECTIVENESS OF RESPONDENTS ACCORDING TO AGE AND FARMING EXPERIENCE, LESOTHO, 1985

AGE INT	AGE DISTR	AGE %	TOLD TOT	SHOW TOT	OBS TOT	FRM/EXP	TOLD %	SHOW %	OBS %	FRM/EXP %
21-30	6	11	92	26	18	27	11	8	7	3
31-40	10	19	77	23	25	57	9	7	9	7
41-50	21	39	460	204	167	30	55	65	62	4
51-60	9	17	146	31	35	167	17	10	13	21
61-70	7	13	37	11	18	191	4	3	7	24
71>	1	2	30	20	5	30	4	6	2	4

The same findings may be seen graphically on Figure 3.8 and Figure 3.9. The general decline in diffusion effectiveness seemingly related inversely to farming experience may be seen in Table 3.11 and Figures 3.10 and 3.11.

TABLE 3.11: DIFFUSION EFFECTIVENESS AND FARMING EXPERIENCE, LESOTHO, 1985

INTERVAL FRM EXP	DISTRIB FRM EXP	% FRM EXP	TOLD	SHOW	OBS	TOLD %	SHOW %	OBS %
0-7	20	37	259	81	78	31	26	29
8-15	15	28	273	95	84	32	30	31
16-23	6	11	105	52	50	12	17	19
24-31	7	13	140	64	40	17	20	15
32-39	5	9	61	22	15	7	7	6
40-47	2	4	4	1	1	0	0	0

FIGURE 3.8: DIFFUSION EFFECTIVENESS ACCORDING TO AGE AND FARMING EXPERIENCE, LESOTHO, 1985

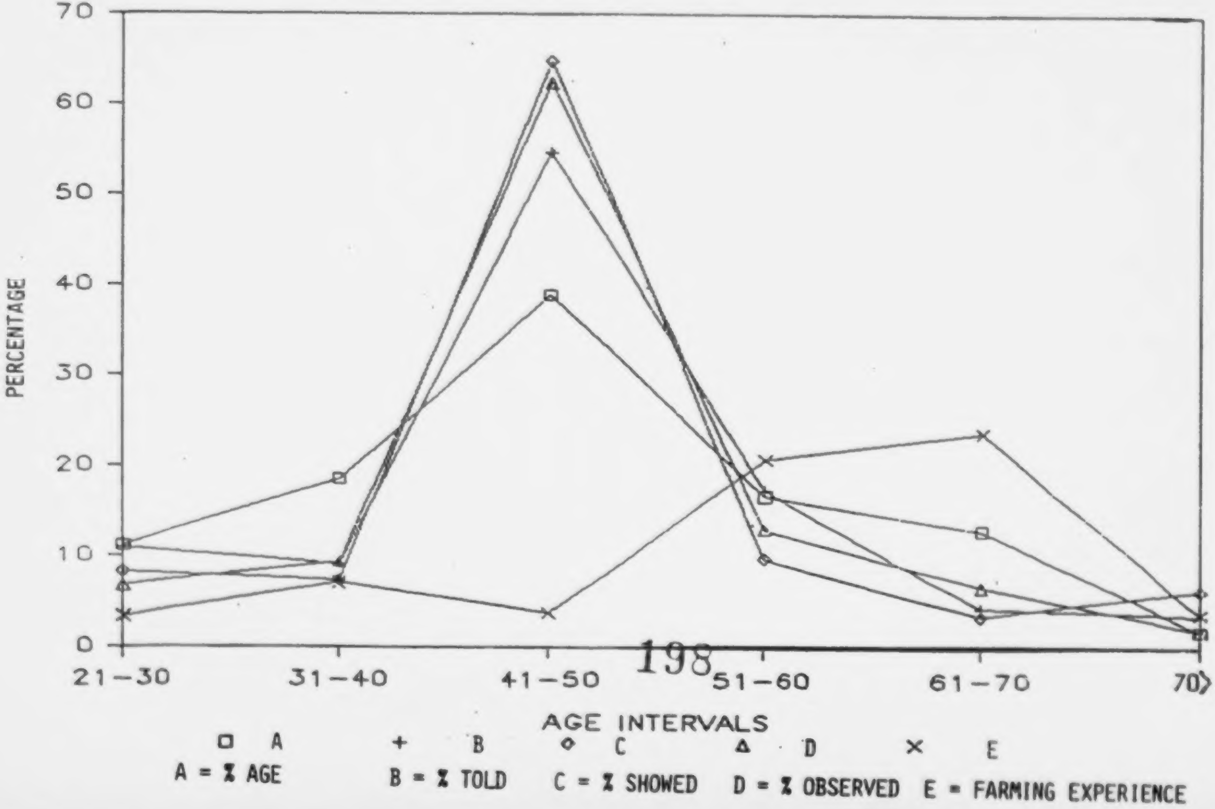


FIGURE 3.9: DIFFUSION EFFECTIVENESS ACCORDING TO AGE AND FARMING EXPERIENCE, LESOTHO, 1985

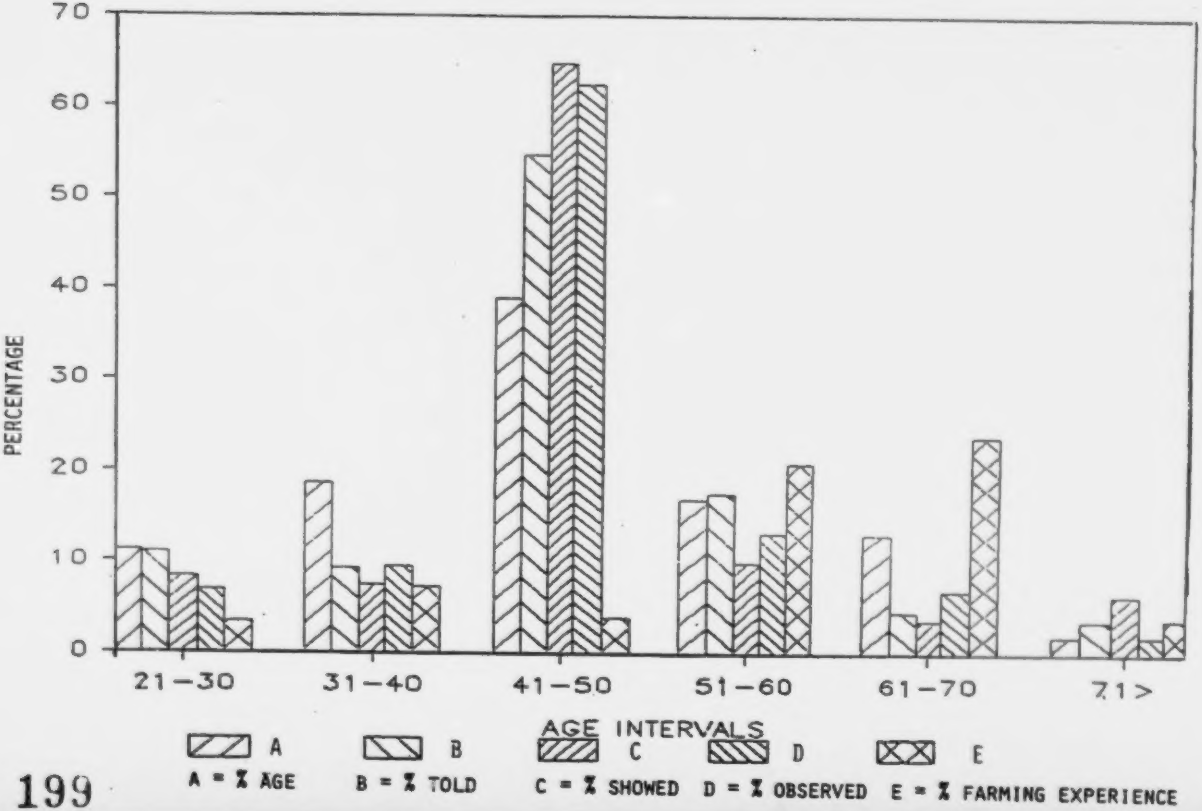


FIGURE 3.10: DIFFUSION EFFECTIVENESS AND FARMING EXPERIENCE, LESOTHO, 1985

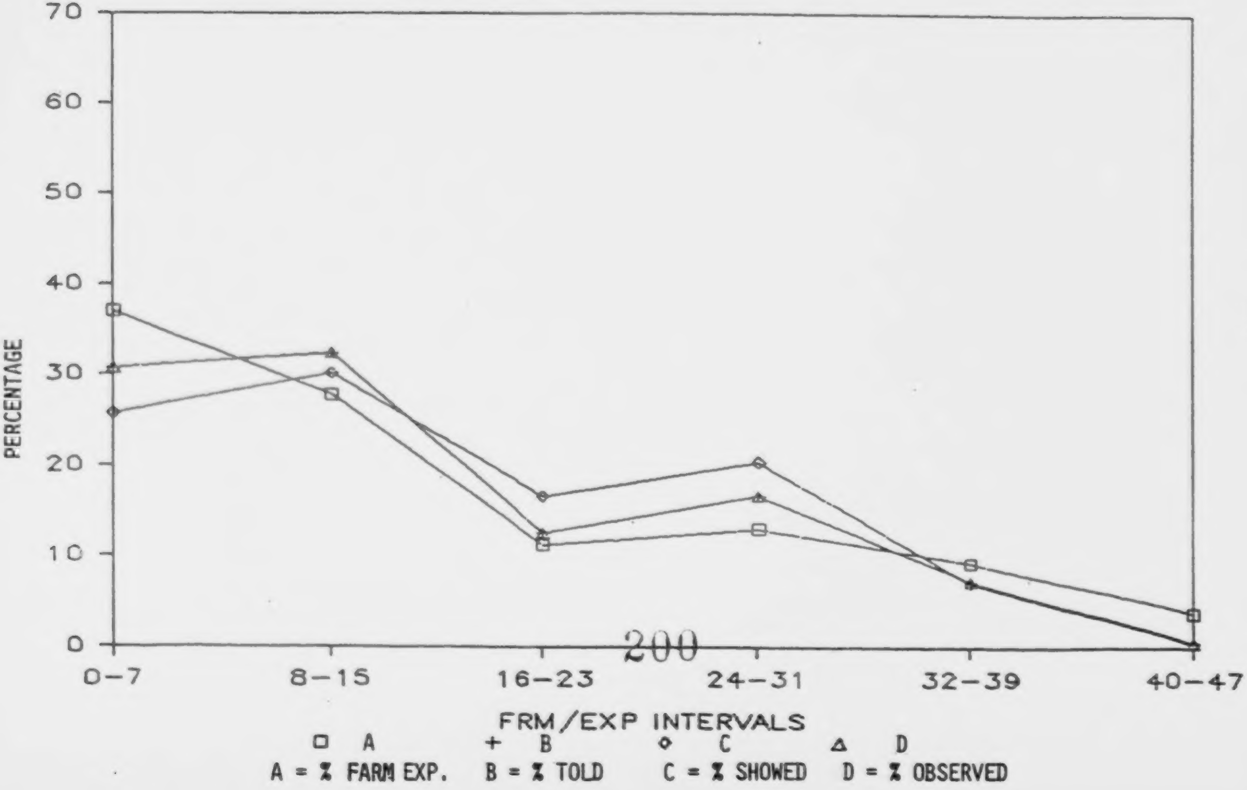
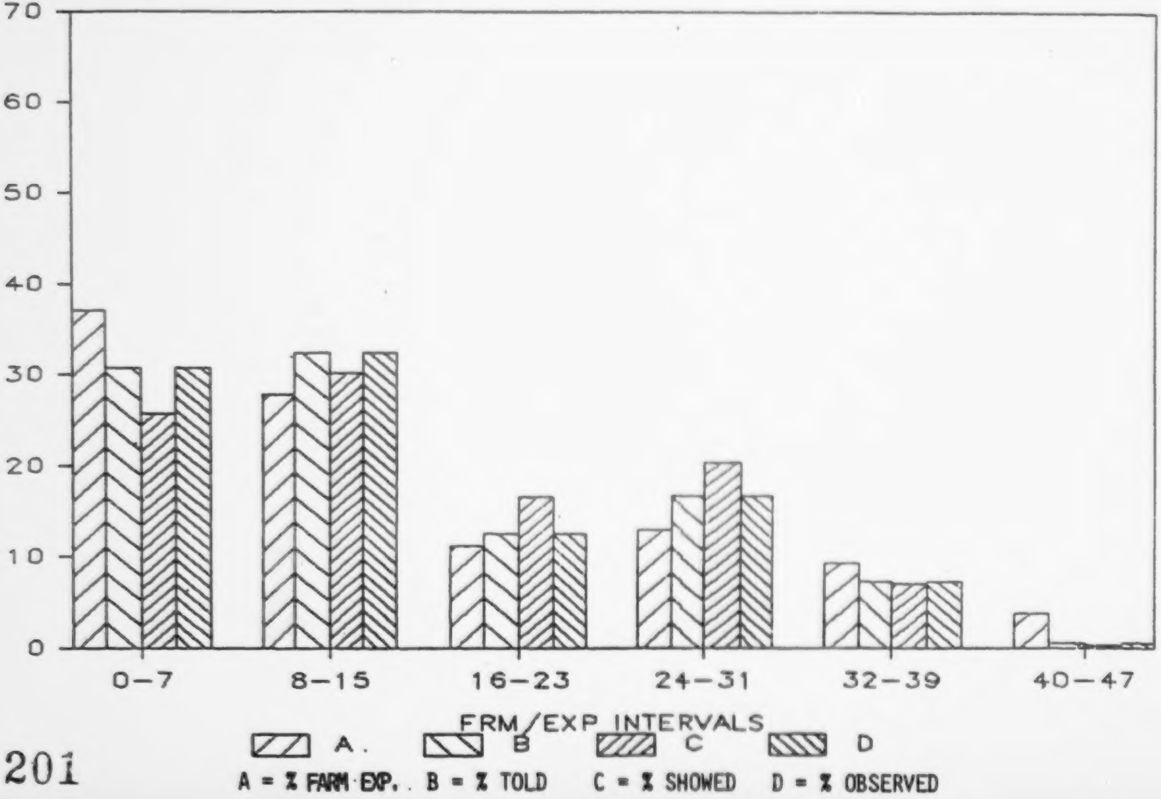


FIGURE 3.11: DIFFUSION EFFECTIVENESS AND FARMING EXPERIENCE, LESOTHO, 1985



3.7 SUMMARY

From the foregoing analysis, it is felt that changes in knowledge, attitudes, skills and aspirations have been achieved among members of farmer contact groups through farming systems research extension education programmes and that such changes are meaningful.

It is also suggested that promising practice change has been achieved among the same membership.

It is proposed that the above KASA and practice change has led to provisional but indicative benefits (end results) among the membership of the farmer contact group.

It is probable that the incidence of the above forms of change bear a positive and increasing relationship to intensity of extension education programmes, an "extension effect".

Members of farmer contact groups appear to be effective disseminators of information and diffusors of innovations, indicating an 8.8 mean multiplier effect for three forms of diffusion over five years.

The impacts of farming systems research extension education programmes among chiefs, headmen and headwomen are examined next.

CHAPTER 4: THE EFFECTS OF FARMING SYSTEMS RESEARCH EXTENSION EDUCATION PROGRAMMES AMONG CHIEFS, HEADMEN AND HEADWOMEN IN THREE LESOTHO PROTOTYPE AREAS

4.1 CHIEFS, HEADMEN AND HEADWOMEN

There are few places in Africa where traditional or tribal power structures do not still continue to exert an important influence on development decisions. In Lesotho, where nearly all nationals are members of the Basotho nation, the system of village, area and principal chiefs is very much alive and dynamic. In fact, at the local and district levels, traditional chiefs wield enormous power, and the district coordinators who are appointed by the prime minister to deal with matters of concern to central government, must at once come to terms with the various chiefs in their respective districts. This is a familiar task, however, since many of the district coordinators are chiefs in their own right and they report to the highest persons in government who are frequently chiefs themselves.

In Lesotho, chiefs are hereditary in that they are of royal blood, the descendants of King Moshoeshoe or other historical African tribal dynasties. In some cases, headmen were appointed by early royalty and although they were not of the royal line, their positions became hereditary as well. Women appear as both chiefs and headwomen in

Lesotho. A woman becomes a chief if her husband dies and she has no son, or if her eldest son is too young. In the former case, she serves till she dies, at which time the next younger brother of the deceased male chief inherits the title which passes to his eldest son and so on. In the latter case, a female chief may abdicate in favour of her eldest son who comes of age. Headwomen appear on the scene in the same fashion and their succession is determined as in the case of the hereditary chiefs.

Traditionally, chiefs are local leaders*. They hold power to convene public assemblies, grant grazing access to the public domain, hear complaints, and resolve conflicts. They also control the movement and guarantee the safe passage of outsiders within their jurisdictions. As a natural extension of that tradition, well informed and supportive chiefs can become most important facilitators of desired change (Youmans, 1985, pp. 4 - 5).

4.2 EXTENSION EDUCATION PROGRAMMES

In view of the above, expatriate Washington State University FSR advisors and national colleagues of the Agricultural

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* With jurisdiction over day to day affairs of citizens.

Research Division realized the importance of local chiefs in advancing the farming systems researh and extension processes. In recognition of the critical and traditional role of such persons, research and extension personnel presented extension courses for the chiefs and headmen/headwomen in the three agroclimatic research prototype areas.

On February 21 - 25, 1983 (Sefeane 1983), and February 13 - 17, 1984 (Youmans, 1985), extension short courses were held for village chiefs, headmen and headwomen at the Matela Farmers' Training Centre. Attendance was 36 and 31 respectively. In major efforts to assist chiefs to become change agents in the farming systems research thrust, a considerable array of topics formed the curricula. Leadership styles and communication skills were taught, and the role of farmer contact groups was explained. The intervention of chiefs themselves as promotors of small agricultural groups and of needed change was explored. Government regulations and policies on agricultural research, basic grains, new crops, grazing control, livestock importation, erosion control, and afforestation were discussed by authorized experts. The advantages to be gained through proper stocking rates and rotational grazing were pointed out. Finally, a clear explanation of farming systems research and a description of the role of chiefs in agricultural development were emphasized. In making chiefs partners in the FSR process, a potential constraint was reduced and a major resource was gained.

4.3 THE RESEARCH PROBLEM

As in the case of farmer contact groups, the research problem became one of determining the potential effects of extension education programmes among these chiefs, headmen and headwomen. It is important to know whether FSR extension has produced perceived changes in the members of this clientele in such important areas as knowledge, attitudes, skills, aspirations, practice change, and end results. Only in that way can programmes be assessed, modified and improved.

4.4 METHODOLOGY

The reflective appraisal of programmes (RAP) methodology, an approach to the study of clientele-perceived results of extension programmes (Bennett, 1983) was again selected as central to this research problem. In that way, the reflective perceptions of the chiefs, headmen and headwomen about the outcomes of the FSR extension education programmes could be ascertained. The methodology would require responses with respect to KASA (knowledge, attitudes, skills and aspirations) changes, practice change in the manner of conducting chiefs' affairs, and end results. This information would be collected by means of an interview/questionnaire process with the entire population of programme participants, and the data would be analyzed in a subsequent section of this chapter using analytical methods most appropriate to the data.

As has been mentioned before, the RAP methodology is a reflective evidence system of determining perceived results of extension programmes. It does this by using, in participant interviews, a series of standardized but modifiable questions to gain as much subjective data as possible which can then be appropriately analyzed and presented (Bennett, 1977, pp. 11 - 20).

4.5 DATA COLLECTION

Consistent with the RAP methodology described above, a questionnaire was constructed to be used concurrently with a face to face interview in order to collect from the chiefs, headmen and headwomen their reflective perceptions of FSR extension education programmes at the KASA, practice change, and end results levels. Brief attention was given to the first four evidence levels of inputs, activities, people involvement and reaction since it was felt that those outcomes were generally known and had been adequately reported elsewhere (Sefeane, 1983, and Youmans, 1985).

Thus, the questionnaire first presented a brief description of the FSR extension education programme for the participants in question, giving dates, venues and content of the two extension short courses. This description and content were immediately validated with the participants in a second question which verified attendance and recollection of course content. Confirmation of the reactions evidence level was ascertained through a third question. Following was a series of standardized but modifiable questions designed to determine client perceived change due to programmes at the important evidence levels of KASA, practice change and end results. Open-end probe questions ensued at the interviewer's discretion designed to verify, challenge or otherwise clarify simple perceptive responses. The data so gathered are subjective in nature. Finally brief bio-data and recommendations were gathered to lend other dimensions to the study.

The same colleague active in farmer interviews was selected to assist in the development and administration of the questionnaire. She was asked to translate the questionnaire to Sesotho assisted by professional colleagues and to then compare meanings to the English original. She was by this time thoroughly familiar with the RAP methodology and interview procedures. Again, she was instructed to make a maximum of three attempts to interview personally in Sesotho each programme participant since the exercise was to be a population survey. Responses were to be recorded by the interviewer herself on individual questionnaires in Sesotho, later to be transferred in English to fresh instruments for the benefit of the principal researcher. The research assistant had been involved in the extension education programme events and had personally worked with all chiefs, headmen and headwomen in the programmes. She enjoyed their support and respect. She was asked to consider her first few interviews as field tests and tentative until she could ascertain that questions were clear and responses accurate. There were no problems in that regard.

The data collection instrument was administered in the form of the described questionnaire and concurrent personal interviews by the research assistant among a target of 36 chiefs, headmen and headwomen in late 1984 and early 1985. Up to three attempts were made to reach each participant. Twenty (20) completed questionnaires were returned to the principal researcher for subsequent presentation and analysis. This represented a 55,6 per cent response.

4.6 PRESENTATION AND ANALYSIS OF DATA

Computer assisted compilation, tabulation, and analysis were systematically executed on 20 completed questionnaires. This represents a 20/36 or a 55 per cent response from chiefs, headmen and headwomen.

4.6.1 Biographical data

Three biographical characteristics were considered as relevant for this sample, namely age interval, sex and time as chief, headman, or headwoman.

a. Age interval

Age interval data indicated there were two persons in ages 21 - 30, one representative in the 31 - 40 age group, three in 41 - 50 age interval, eight persons in the age 51 - 60 group, one in the 61 - 70 group, and two in the 81 - 90 age interval. There is considerable age variability in the sample, with a range of 28 years of age. Clearly though, the highest frequency (40%) of these village officials were in the 51 - 60 year age interval.

b. Sex

Of the 20 respondents in the sample, 11 (55%) were male and 9 (45%) female. It is reasonable to assume that these data extend to rural Lesotho in general. Thus, in the case of chiefs and headpersons as with members of farmer contact groups, women play a major role in Lesotho agriculture and rural development in general.

c. Time as chief or headperson

Of the sample, 10 respondents had served as chief, headman or headwoman between 1 - 10 years, six from 11 - 20 years, one from 21 - 30 years, two from 31 - 40 years, and one from 51 - 60 years. The range of service was 3 - 60 years. However the greatest frequency (50%) had served ten years or less.

4.6.2 People involvement and validation of course content

Fourteen (14) respondents (70%) attended both short courses conducted for this clientele, while six (30%) attended one of the two short courses.

All 20 persons (100%) reported that the description of the content of the short courses as it appeared on the interview questionnaire was accurate so far as they knew.

4.6.3 Reactions

When asked to respond to what extent the course(s) met the respondents' expectations at the time, again all 20 respondents indicated that it (they) had done so to a great extent. These, with the comments stated earlier, serve to establish highly positive feelings on extension education programmes for chiefs and headpersons at the first four evidence levels of inputs, activities, people involvement, and reactions. Investigation into KASA, practice change and end results will show whether or not those levels are sustained.

4.6.4 KASA and practice change

Respondents were asked standardized but modified questions about knowledge, attitudes, skills and aspirations which were acquired, developed or enhanced as a result of their participation in the short course(s) held for their benefit. They were also asked about the levels of subsequent practice change directly associated with the learning attained in KASA. The response scale was again number coded to facilitate tabulation, as follows:

- to a great extent	(3)
- to a fair extent	(2)
- to a slight extent	(1)
- not at all	(0)
- don't know/don't recall	(X)
- other	(Z)

Scores were then compiled and analyzed, and important findings follow. Since the topic "stocking rates" was repeated on the questionnaire, topic number 8 is eliminated from the data in favour of topic number 13. Likewise, there were no "Z" (other) responses appearing in the data.

a. Extension education programmes

There were nineteen original topics taught to chiefs and headpersons in the short course(s). These are numbered 1 to 19 in the data, minus Topic 8 as explained above. These topics constitute the content axis of the data tables and their interpretive legend is as follows:

Topic number:

1. Leadership styles and communications
2. Role of chiefs in agricultural development

3. Role of farmer contact groups
4. Role of chiefs as facilitators of groups
5. Chiefs' attitudes toward agriculture
6. Farming systems research concept
7. Agronomy research in grain and crops
9. Chieftainship Act of 1968
10. Grazing control regulations
11. Rotational grazing
12. Range research in prototype areas
13. Stocking rates
14. Livestock policy and production
15. Importation of livestock
16. The abattoir
17. Animal science in the prototype areas
18. Anti-erosion works regulations
19. Forestry/woodlot policies.

Table 4.1 shows the responses of the 20 persons in the sample to the questions on these topics, and Table 4.2 presents the same data in response percentages.

b. KASA findings

As is clearly seen, the 20 respondents reported high incidences of perceived changes in knowledge, attitudes, skills and aspirations in topics numbered 1 through 10, and

TABLE 4.1: RESPONSES OF CHIEFS AND HEADMEN/WOMEN TO QUESTIONS ON PERCEIVED KASA AND PRACTICE CHANGE RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985 (RAW SCORES)

TOPIC**	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	15	2	1	2	0	17	1	0	2	0	13	4	1	2	0	15	3	0	2	0	3	10	3	2	2
2	18	1	0	1	0	17	2	0	1	0	13	5	1	1	0	16	3	0	1	0	5	7	6	1	1
3	14	3	1	2	0	15	3	0	2	0	8	8	1	3	0	14	4	0	2	0	3	9	4	2	2
4	12	5	0	3	0	12	5	0	3	0	10	6	0	3	1	9	7	0	3	1	3	9	2	3	3
5	16	2	0	2	0	18	0	0	2	0	15	2	1	2	0	17	1	0	2	0	10	6	2	2	0
6	8	6	2	3	1	12	3	2	3	0	5	7	3	4	1	9	5	1	4	1	4	8	2	5	1
7	6	3	4	7	0	9	2	2	7	0	4	2	6	8	0	9	3	1	7	0	2	5	3	8	2
9	18	0	0	2	0	17	1	0	2	0	12	3	2	3	0	16	2	0	2	0	11	4	1	4	0
10	18	2	0	0	0	18	2	0	0	0	13	5	2	0	0	17	2	1	0	0	5	3	4	0	8
11	12	3	1	3	1	13	1	2	3	1	9	4	3	3	1	11	2	3	3	1	2	2	4	3	9
12	2	5	1	11	1	4	3	1	11	1	1	4	3	11	1	7	1	0	11	1	0	1	2	13	4
13	5	3	1	11	0	7	2	0	11	0	4	3	0	10	3	8	1	1	10	0	3	1	2	8	6
14	6	0	1	13	0	6	0	0	14	0	4	2	0	14	0	5	1	0	14	0	2	3	1	14	0
15	6	0	0	14	0	6	0	0	14	0	4	1	0	15	0	3	3	0	14	0	3	2	1	14	0
16	0	3	0	17	0	0	3	0	17	0	0	3	0	17	0	0	3	0	17	0	0	1	0	15	4
17	10	3	1	6	0	12	1	1	6	0	6	4	4	6	0	11	2	1	6	0	8	3	2	6	1
18	14	4	0	2	0	13	3	0	4	0	11	5	2	0	2	16	2	0	2	0	9	4	2	2	3
19	8	4	1	6	1	11	2	0	6	1	5	5	3	6	1	11	2	0	6	1	2	3	4	6	5

* FARMING SYSTEMS RESEARCH

** TOPIC NUMBER SUBJECT EQUIVALENTS ON PAGES 176 AND 177

TABLE 4.2: RESPONSES OF CHIEFS AND HEADMEN/WOMEN TO QUESTIONS ON PERCEIVED KASA AND PRACTICE CHANGE RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985 (PERCENTAGE)

TOPIC**	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	75	10	5	10	0	85	5	0	10	0	65	20	5	10	0	75	15	0	10	0	15	50	15	10	10
2	90	5	0	5	0	85	10	0	5	0	65	25	5	5	0	80	15	0	5	0	25	35	30	5	5
3	70	15	5	10	0	75	15	0	10	0	40	40	5	15	0	70	20	0	10	0	15	45	20	10	10
4	60	25	0	15	0	60	25	0	15	0	50	30	0	15	5	45	35	0	15	5	15	45	10	15	15
5	80	10	0	10	0	90	0	0	10	0	75	10	5	10	0	85	5	0	10	0	50	30	10	10	0
6	40	30	10	15	5	60	15	10	15	0	25	35	15	20	5	45	25	5	20	5	20	40	10	25	5
7	30	15	20	35	0	45	10	10	35	0	20	10	30	40	0	45	15	5	35	0	10	25	15	40	10
9	90	0	0	10	0	85	5	0	10	0	60	15	10	15	0	80	10	0	10	0	55	20	5	20	0
10	90	10	0	0	0	90	10	0	0	0	65	25	10	0	0	85	10	5	0	0	25	15	20	0	40
11	60	15	5	15	5	65	5	10	15	5	45	20	15	15	5	55	10	15	15	5	10	10	20	15	45
12	10	25	5	55	5	20	15	5	55	5	5	20	15	55	5	35	5	0	55	5	0	5	10	65	20
13	25	15	5	55	0	35	10	0	55	0	20	15	0	50	15	40	5	5	50	0	15	5	10	40	30
14	30	0	5	65	0	30	0	0	70	0	20	10	0	70	0	25	5	0	70	0	10	15	5	70	0
15	30	0	0	70	0	30	0	0	70	0	20	5	0	75	0	15	15	0	70	0	15	10	5	70	0
16	0	15	0	85	0	0	15	0	85	0	0	15	0	85	0	0	15	0	85	0	0	5	0	75	20
17	50	15	5	30	0	60	5	5	30	0	30	20	20	30	0	55	10	5	30	0	40	15	10	30	5
18	70	20	0	10	0	65	15	0	20	0	55	25	10	0	10	80	10	0	10	0	45	20	10	10	15
19	40	20	5	30	5	55	10	0	30	5	25	25	15	30	5	55	10	0	30	5	10	15	20	30	25

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** TOPIC NUMBER SUBJECT EQUIVALENTS ON PAGES 176 AND 177

17 through 18. Likewise, number scores of "3" (to a great extent) tended to dominate the frequency distribution. Although Topic Number 11 shows more variability, favourable KASA scores tend to prevail. Thus, it may be said that chiefs and headmen/headwomen experienced significant learning through FSR extension education programmes about their various roles in the village setting related to agricultural development. They also came to understand the farming systems research concept and FSR field activities in agronomy, rotational grazing, and animal science, with variability of KASA changes increasing considerably in the latter to include some responses demonstrating less than adequate learning. The respondents likewise reported high levels of perceived KASA change in anti-erosion works regulations, forestry/woodlot policies, grazing control regulations and the Chieftainship Act of 1968.

In marked constrast to the above, the data show a rather dramatic incidence of inadequate KASA change and non-recall on Topic 12 through 16. These topics about which comparatively little change was achieved and a great deal of non-recall experienced, were range research in the prototype areas, stocking rates, livestock production and policy, importation of livestock, and the abattoir.

c. Practice change

Practice change data tend to show a similar configuration to KASA change data. Albeit with considerably more variability and non-adoption at the practice change level of evidence, the majority of the response scores and percentages are not surprising.

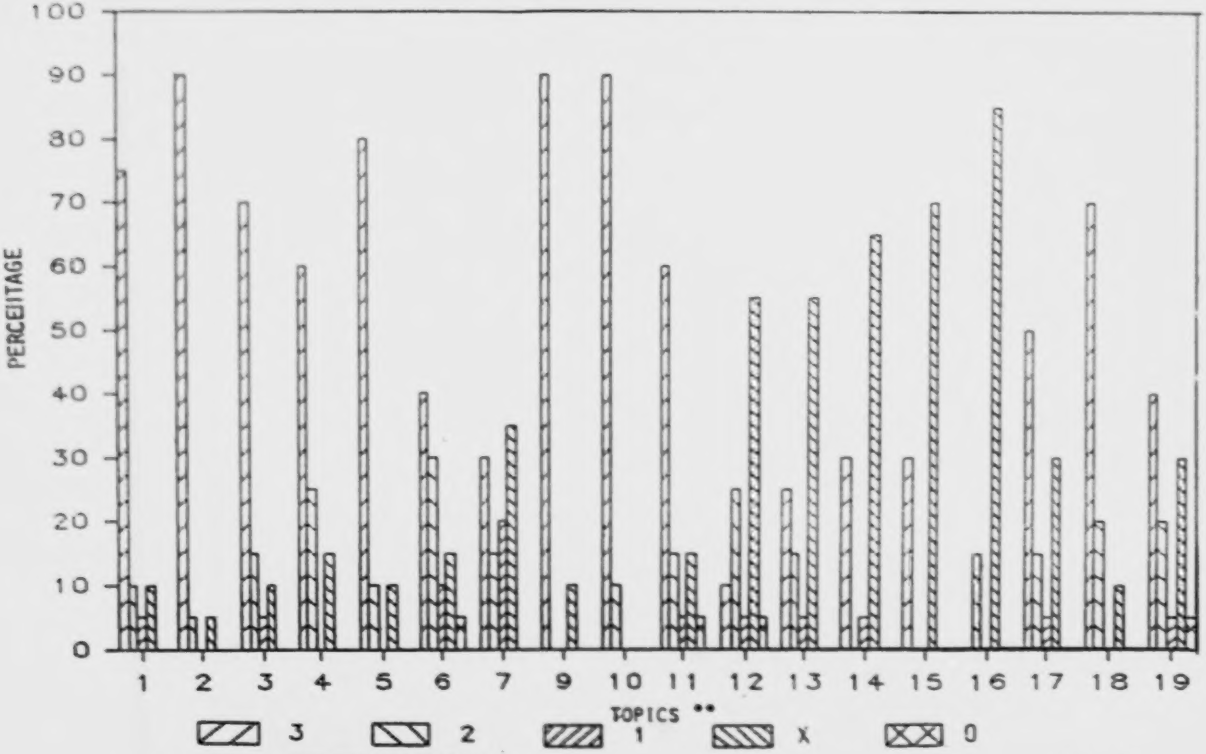
What is potentially disturbing here is that much of the low incidence of practice change (non-adoption) in the realm of Topics 12 through 16 seem to be directly related to inadequate learning and low recall about those topics. The topics again are range research in the prototype areas, stocking rates, livestock production and policy, importation of livestock, and the abattoir.

Since these topics account for 27,8% of the extension education programmes among chiefs, headmen and headwomen, the causes behind this shortfall must be subsequently investigated. The response and percentage data just examined may be seen graphically in Figures 4.1 through 4.5.

d. Examples of practice change

Apart from the rather positive but unspecified rate of

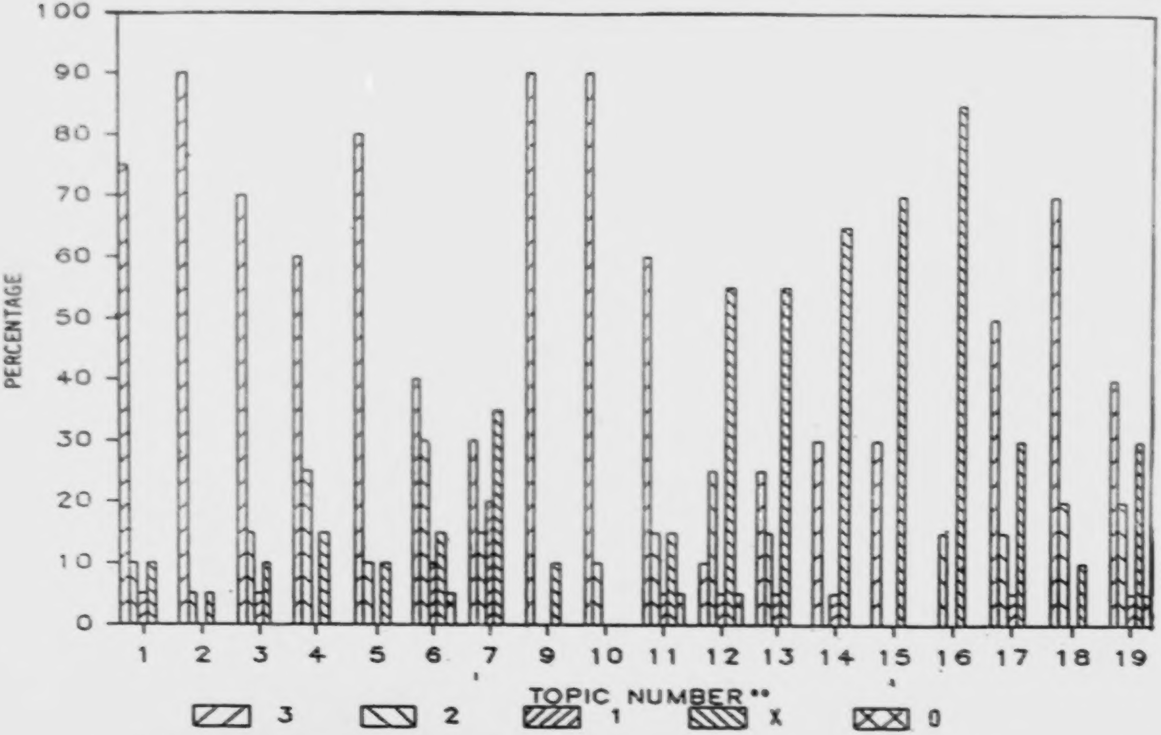
FIGURE 4.1: KNOWLEDGE CHANGES IN CHIEFS AND HEADMEN/WOMEN ABOUT TOPICS RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985



* FARMING SYSTEMS RESEARCH

** SUBJECT EQUIVALENTS OF TOPICS NUMBERS 1 - 19 ON PAGES 176 AND 177

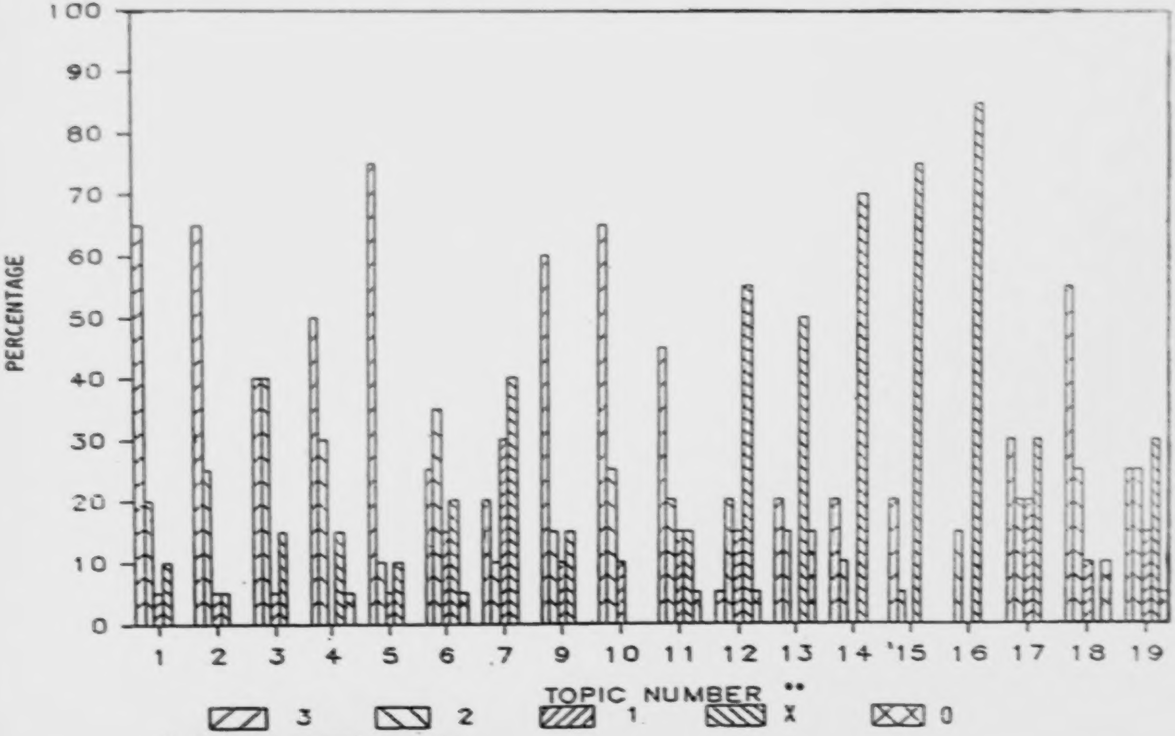
FIGURE 4.2: ATTITUDE CHANGES IN CHIEFS AND HEADMEN/WOMEN ABOUT TOPIC RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985



* FARMING SYSTEMS RESEARCH

** TOPIC NUMBER SUBJECT EQUIVALENTS ON PAGES 176 AND 177

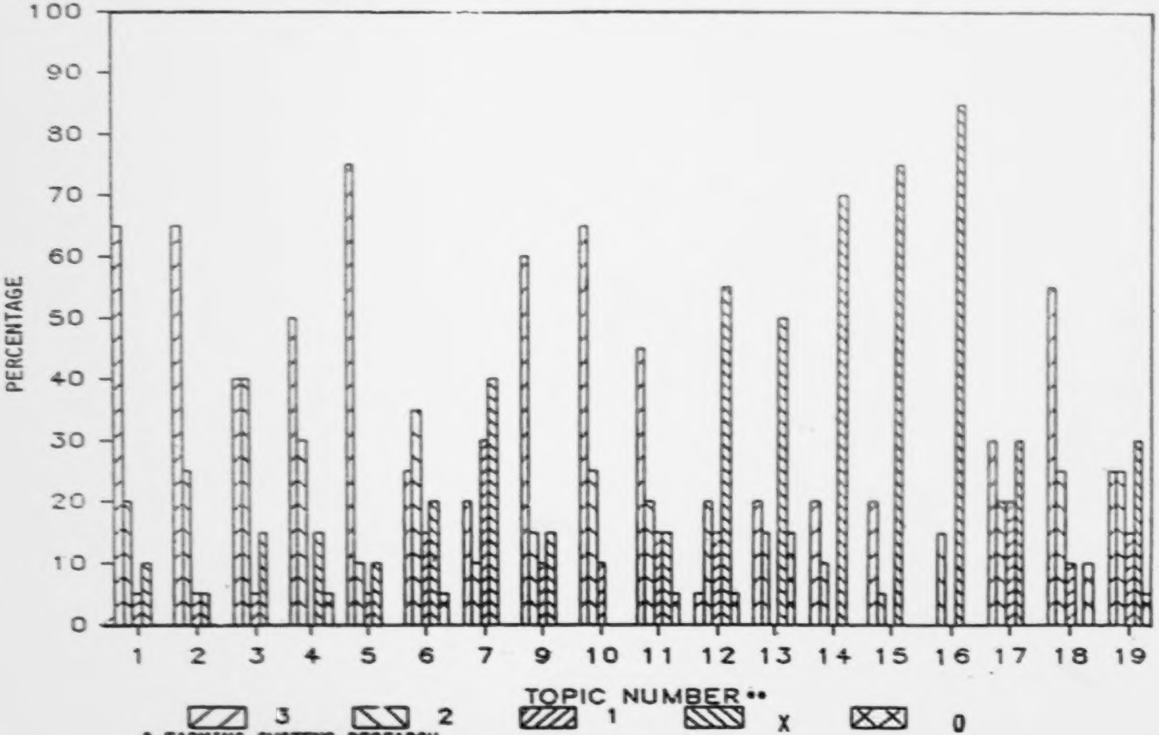
FIGURE 4.3: SKILLS CHANGES IN CHIEFS AND HEADMEN/WOMEN IN TOPICS RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985



* FARMING SYSTEMS RESEARCH

** SUBJECT EQUIVALENTS OF TOPIC NUMBER ON PAGES 176 AND 177

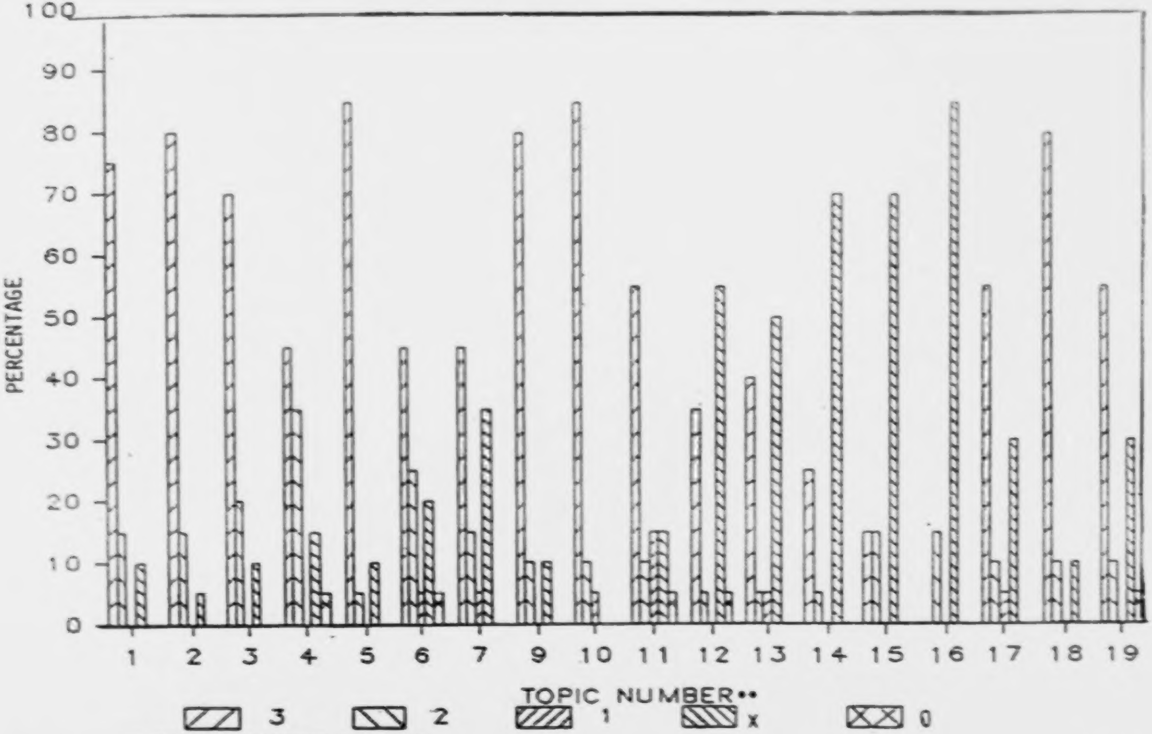
FIGURE 4.4: ASPIRATIONS CHANGES IN CHIEFS AND HEADMEN/WOMEN ABOUT TOPICS RELATED FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985



* FARMING SYSTEMS RESEARCH

** SUBJECT EQUIVALENTS TO TOPIC NUMBERS ON PAGES

FIGURE 4.5: PRACTICE CHANGES OF CHIEFS AND HEADMEN/WOMEN IN TOPICS RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985



* FARMING SYSTEMS RESEARCH
** SUBJECT EQUIVALENTS OF TOPIC NUMBERS ON PAGES 176 AND 177

practice change reported in the data, a number of respondents described examples of practice change which are helpful to this study.

Respondent 6 said he learned more about motivation skills and is motivating his people more effectively. He thinks this has been a great help. He also said that almost everything he learned helped him to apply new methods and approaches to his work which since seems to be going well.

Respondent 7 said he organized group meetings and used the knowledge gained from the courses; thus, his discussions were good. He also taught his people about the importance of fertilizers and encouraged fertilizer use. Some villagers are now doing so.

Respondent 10 said he had seen improvement in his neighbours' cattle. He also reported that his people had constructed many dams.

Respondent 17 said more of her people use fertilizers and certified seed. She likewise reported that the villagers understood and now practiced rotational grazing. Finally she indicated that her people had built silt traps in many dongas and had also planted kikuyo grass.

e. Constraints to practice change

Constraints to practice change were expressed freely by respondents. Some were related to the non-learning/non-recall phenomenon described above. Others were voiced more in the context of frustration over not being able to apply new capabilities developed in the KASA change process.

Some of the constraints specified included the difficulty of promoting rotational grazing among people who do not understand the concept, young trees being destroyed by herdboys and animals, villagers not understanding grazing control regulations, lack of dissemination of range research results among chiefs, and quarrels among some farmer contact group members.

Yet other constraints were lack of knowledge by chiefs of agronomy research results, lack of knowledge about tree seedling procurement, incomplete understanding of stocking rate concept, inadequate comprehension of farming systems research concept, non-response to chiefs' leadership, frustration over non-function of the abattoir, and non-interest in forestry.

More constraints included the need to know how to care for young trees and incomplete understanding of chiefs' role in agricultural development. While most of these constraints were voiced by individual respondents, the constraints to grazing control, stocking rate attainment, and/or rotational grazing were mentioned by 14 (70%) of the respondents.

4.6.5 End results

Of the 20 chiefs and headmen/women who participated in FSR extension education programmes, 19 (95%) are active in decision-making about agriculture. All 20 (100%) said they had benefited from these educational programmes and actively support farming systems research as a development strategy. Reasons stated in support of the latter included its problem-solving achievements, assistance in improving agriculture, interest in agricultural development activities, its extension education programmes, positive research results in the community, an eagerness for agricultural development in the nation, and a willingness to help people.

Other reasons given were the chiefs' interest in the fight against hunger, interest in community progress, greater interest in agriculture, enhancement of knowledge, eagerness to improve agricultural methods, and desire for area improvement.

4.6.6 Recommendations

Only six respondents (30%) have offered recommendations on the FSR extension education programmes to date. One (1) felt there was a continued need for training on pasture management and improvement of livestock. One (1) called for more education in forestry. Two (2) persons said that more training was needed on the Chieftainship Act of 1968. And two (2) others stated an incongruency in extension education programmes for local chiefs and headmen/women and no such programmes for area chiefs.

4.7 SUMMARY

Chiefs and headmen/women from villages in farming systems research prototype areas participated in extension education courses in 1983 and 1984. A sample of 20 of these participants reported having experienced positive KASA changes in several subject matters, and having done so largely to a great extent. The same respondents indicated having also made selective practice changes in the same subject matters (topics) in their role as village leaders, although there was more variability in the intensity of practice change. The subject matters taught, which elicited such positive responses at these higher evidence levels, included leadership styles and communications, role of chiefs in agricultural production, role of farmer contact groups, role of chiefs as facilitators of groups, chiefs' attitudes toward agriculture, farming systems research concept, agronomy research in grain and crops, Chieftainship Act of 1968, grazing control regulations, rotational grazing, animal science in prototype areas, anti-erosion works regulations, and forestry/woodlot policies.

In contrast, consistently more than 50 per cent of the respondents, the percentage sometimes rising to 85 per cent, either failed to learn or could not recall the content of extension education in the topics of range research in prototype areas, stocking rates, livestock policy and production, importation of livestock and the abattoir.

From the data at hand, it is not possible to explain this contrast, and attempts to do so would result in educated guesses at best. Instructional effectiveness, quality of content, participants' interest levels, relevance of material, and participants' comprehension levels are suggested as possible points of departure for further study of this phenomenon.

Important constraints to practice change were found in the areas of grazing control, stocking rate, and rotational grazing.

Despite the mixed KASA and practice change results, chiefs and headmen/women are active in decision-making about agriculture, benefited positively from FSR extension education programmes and actively support farming systems research as a development strategy. The consensus on these three points was total.

A third important clientele which participated actively in FSR extension programmes in Lesotho is comprised of district-based extension workers and subject matter specialists. The impacts of those programmes will be assessed next.

CHAPTER 5: THE IMPACT OF FSR EXTENSION EDUCATION PROGRAMMES ON DISTRICT-BASED EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS

5.1 EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS

The Lesotho Ministry of Agriculture and Marketing carries out its field operations largely through district-based personnel who work and reside throughout the ten administrative districts of the country. This cadre of agricultural workers, who report to a district agricultural officer, includes extension workers and subject matter specialists. Both of these groups are fundamentally important to agricultural development. Extension workers are engaged in extension education programmes directly with farmers on crop production, animal management, conservation and range issues. Subject matter specialists provide technical expertise and guidance for extension workers who are largely generalists. The latter may call on the subject matter specialist to address farmers directly on specific topics if the situation requires such direct exchange.

Most extension assistants, who are the front line field extension workers, hold the Certificate in Agriculture credential from Lesotho Agricultural College. This represents two years of general agricultural studies with basic instruction in extension methods. Other extension personnel, such as district extension officers may hold diplomas in agriculture from Lesotho Agricultural College or similar institutions, or may have simply worked their way up through the system without the benefit of additional formal education. Thus, it can be seen that the people with the least education and the least experience are the same people who are cast into the specific role of educating and advising farmers. As might be expected, this is not the ideal organization for diffusion of agricultural innovations.

Subject matter specialists are largely district-based as well. They bear such titles as district crops officer, district livestock officer, and so on. These officers tend to be more specialized than the extension workers. They may hold diplomas from Lesotho Agricultural College in general or specialized studies, or even the Baccalaureate degree from foreign universities. On the other hand, some may hold the same Certificate in Agriculture as the extension workers they must advise, and have acquired their "expertise" through exposure, experience or short-term participant training. Their principal role is to advise and train extension workers in technical subject matter. Their responsibility is to maintain professional currency in their respective disciplines.

In Lesotho an extension worker at the village level may be expected to provide education programmes for as many as 250 farm families. A subject matter specialist may expect to advise approximately 30 extension workers. These complementary efforts form the fabric of the principal diffusion network in Lesotho for agricultural innovation and development.

5.2 EXTENSION EDUCATION PROGRAMMES

The extension education programmes provided by farming systems research and extension personnel of the Research Division for extension workers fit that type described by Harbison (1973, p. 5) as "activities oriented primarily to develop the skill and knowledge of members of the labour force who are already employed".

In extension lexicon, such activities are variously known as continuing education, staff development, professional improvement, or in-service education programmes. By whatever name, the extension education opportunities provided for this clientele during 1982 through 1984 were based on systematic needs assessments and were designed to strengthen the professional currency of field officers through education in extension methods and technical agriculture.

This continuing education programme for district-based extension workers and subject matter specialists became an acquired role for farming systems research personnel because of three prevailing conditions. First, the terms of reference for the principal researcher, who arrived in Lesotho in October 1981, specifically mandated the provision of "training and guidance to field extension staff in principles and methods of extension education to facilitate the transfer of research findings to village farmers, and to offer in-service training, as needed, to extension field staff ... who would benefit from an improved understanding of group processes, leadership techniques and communications. Presentation of project-provided information might also be included" (Bath, 1980, pp. 1 - 2). The second condition was the challenge tendered by the Principal Secretary of Agriculture in 1981 to extend the training and education capabilities of farming systems research and the Research Division beyond the boundaries of the prototype areas. And, the third prevailing condition lay in the attachment of experienced and knowledgeable research and extension personnel, national and expatriate to the Research Division. These conditions provided for what was seen by the leadership of the Extension Division* of the Ministry of Agriculture, as a valuable training and education resource within the ministry. It followed that joint conferences and planning sessions were held among members of the Research Division, the Extension Division and Agricultural Information Services in order to activate that resource.

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* Before decentralization of this division.

5.2.1 "Extension for improvement of farming systems" course

(a) Introduction

In October 1981, the Principal Secretary for Agriculture and Marketing in Lesotho invited the Farming Systems Research Project to extend its training capability beyond its prototype activities and beyond the confines of Research Division*. In terms of extension training and staff development, it became quickly apparent that the most fertile ground for sharing extension methods, techniques and skills adapted to the world of developing agriculture in Lesotho was to be found among the extension personnel already in the countryside. These personnel numbered 142 and were widely deployed throughout the ten administrative districts nationwide. Professional levels at MOA Headquarters included director, advisor, chief extension officer and senior extension officer. In the field, the professional levels were district extension officer, area extension officer and extension assistant. They were all supported by subject matter specialists who were then members of other MOA technical divisions.

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* For Ministry of Agriculture personnel only, as stated in Chapter I.

(b) Development

The development phase of the proposed training involved two basic and very complex activities. Since all but six members of the prospective trainees were employees of Extension Division and thus not under Research Division's jurisdiction, the director of extension, the chief training officer and relevant MOA staff were consulted frequently during the development phase. Based on information on file elaborated by BASP and USAID advisors to extension*, augmented by the knowledge of research extension group members, a course syllabus was elaborated. This course syllabus was guided through all channels concerned by the research extension officer and the principal researcher. Concurrence on course content was secured from Research Division, farming systems research, chief training officer, Extension Division, director of technical services and the principal secretary.

Concurrence achieved, the commitment toward recruitment of trainees commenced. This was accomplished in five ways. The director of research communicated Research Division's invitation to the districts. The director of extension issued instructions to the districts for trainee selection.

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* Needs assessment.

It was jointly proposed by the principal researcher on assignment in Lesotho and the research extension officer that an extension training course be developed on a fifteen-day schedule for mid-level extension workers, namely area of extension officers and research extension assistants. The proposal was approved by Research Division and supported by the FSR project director then on visitation in Lesotho. The proposal gained strong support of the directors of technical services and Extension Division as well as the chief training officer. The DAO's* likewise indicated support for procedures. Farming systems research agreed to sustain the costs of instruction. Research extension personnel travelled to each and every district securing commitments of DAO's and DEO's** to the process of trainee selection. Agricultural Information Service cooperated with local press and radio propaganda about the event, which was matched by Radio South Africa. Finally, thirty-one top candidates were designated as trainees.

The Mazenod conference centre, administered by the Roman Catholic Church, was selected as a training site. Well endowed with lecture hall, group discussion rooms, libraries, dormitories and mess hall and secluded in an attractive location miles from downtown Maseru, it proved to be an excellent choice.

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* District agricultural officers.

** District extension officers.

The next task was to assign units of subject matter course content to the best resource people available. All members of the research extension and rural sociology groups agreed to teach. Assignments were likewise accepted by other research officers and all FSR team members. Further invitations to teach were extended to key officers in the Extension Division and to selected resource persons from the National University of Lesotho, Agricultural Information Service, and Conservation and Range Development Project, Conservation Division, FAO, Woodlot Project, BASP*, Renewable Energy Project, Nutrition Department and World Bank. All invitations were accepted without exception. The final syllabus was then duplicated and distributed, and periodic follow-up was done.

(c) Implementation

For eleven days in February 1982, thirty-one area extension officers and research extension assistants received instruction in extension for the improvement of farming systems. The course was opened by the director of technical services on behalf of the Principal Secretary for Agriculture. Instruction exceeded 80 hours and included such units as extension in Lesotho, understanding your organization, cultural implications for extension, lay leadership, communications skills, motivation, extension methods, teaching agriculture effectively, soils, animal science, agronomy, forestry, extension demonstration field trip, programme development cycle, writing extension objectives, programme evaluation, appropriate technology in extension, farming systems concepts, roles of village agricultural committees marketing, range management and farm management.

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* Basic agricultural services programme.

Course direction was provided by the research extension officer and the FSR extension specialist (principal researcher). Coordination and logistics were carried out by the research extension technical officer and the research extension assistant. Support and analysis were assisted by the research rural sociologist and assistant. The course was officially closed on February 26, 1982 by the Maseru district coordinator.

(d) Evaluation

A comprehensive evaluation instrument was devised and administered on the final day of the course. The participants themselves agreed to share their impressions and assign values to the many components and aspects of the training.

Personal and group progress, as well as learning acquired, was rated medium to high. The trainers, along with training aids and techniques, were judged medium to high as well. Comparison to other training received was high.

Comments on course content were favourable but pointed out a need for more practicals to balance out theoretical instruction and mentioned the time constraint. It was generally felt trainers were helpful, but called on them to be more practical and allow themselves more time on each topic. The way trainers organized, planned and conducted the course made participants feel happy, satisfied and motivated.

Participants learned most from group discussions and from the farm machinery officer. Most felt they got from the course all they had expected. However, some wanted more horticulture and general practicals. Most popular topics varied widely, but communications skills was most popular followed by farm machinery. Least popular were once again scattered, but food preservation was least popular followed by forestry. Learning preferences for the future seem to have a practical subject matter trend, mentioning such topics as ox-drawn farm machinery repair, farm machinery practicals, agronomy and soil sampling practicals. A like number, however, felt the current balance in course content to be satisfactory. (Youmans and Sefeane, 1982, pp 1 - 5). This initial extension education programme for district-based personnel was thus executed and evaluated through the first four evidence levels of inputs, activities, people involvement, and reactions as in Bennett (1980, pp. 4 - 13).

5.2.2 "Professional improvement in agricultural extension" course

(a) Introduction

The training of district extension officers in extension methods and techniques appropriate to developing agriculture and in up-dated technical agriculture subject matter was established as a priority need in 1981. While this need* was largely ascribed it was derived from a set of priorities developed earlier by the Extension Division itself in consultation with members of its several employee levels. Further, the nature of the need was refined by members of the research extension component, in visitation to districts, with district personnel.

During the training course at Mazenod in February 1982 in "Extension for the Improvement of Farming Systems" Research

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* This need had as its basis the low productivity of Lesotho's farmers in both crops and livestock, along with related concerns.

Extension was encouraged by the director of extension services to include subject matter specialists in the July training on the rationale that at the district level, the work of the SMS[*] is extension in nature while those same SMS's have not received training in extension skills and techniques. The combined rationale joined together the needs of DEO's[*] and SMS's[**] and scheduled one week of intensive training in extension and a second week of technical agriculture instruction for a joint projected audience of 10 DEO's and 20 SMS's.

The objective for the course, then, was to enhance the extension skills and agricultural knowledge of DEO's and SMS's toward higher rural productivity in Lesotho.

(b) Development

Development of the course was once again somewhat complex since it involved an audience other than the Research Division and clearances for released time had to be secured. The director of research was influential in that task. Additionally, as is the policy of Research Division, top quality lecturers were invited in order to augment the capability of research personnel. Course development ultimately included the consulting role and instructional expertise of a Washington State University consultant and the associated communications and travel arrangements required to integrate his contribution into course development and implementation. Logistics were problematic in terms of meeting place, timing and funding in that the pressure for released time for MOA personnel increased with the advent of other course offerings, and scheduling became very tight. Again, the director of research played an important support role in that connection. Double-booking at Mazenod required that the Research Division procure other conference facilities, in short supply in the Maseru area. The choice of Airport Hotel increased the training costs considerably, a consideration which had to be reconciled with Farming System Research Project budget capabilities.

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[*] Subject matter specialists.
[**] District extension officers.

The end of the development stage found the two-week course structured around a week of extension training and a second week of technical agriculture instruction at Airport Hotel conference facility for district extension officers and subject matter specialists. A variety of guest lecturers were invited to complement the resources of Research Division*.

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* Professionals of the highest quality were enlisted from the Lesotho Ministry of Agriculture, Washington State University, Land Conservation and Range Development Project and National University of Lesotho.

(c) Implementation

An instructional course on "Professional Improvement in Agricultural Extension" started on July 12th and was terminated on July 24th. Five district extension officers and twenty-five subject matter specialists from all ten districts attended. The course was opened by the chief extension officer on behalf of the director of the Extension Division. The introductions were made by the director of research.

Basic extension instruction included the following units: philosophy of extension, programme development cycle, your agricultural career, effective listening, communication skills, extension management, the farming systems approach, cultural implications for extension, culture and values, needs assessment, writing extension objectives, demonstrations and field trips, motivation skills, lay leadership, training and visit system, interrelationship in agriculture, organising effective pitsos, the role of village agricultural committees and programme evaluation. Technical agriculture units included were: farm machinery, marketing, forestry, agronomy, plant protection, horticulture, soil conservation, animal science and range science. (Matobo et al, 1982, pp. 1 - 4).

(d) Evaluation

An evaluation of the workshop was planned and carried out since the organizers and coordinators of the workshop were interested in evaluating a number of key factors. These factors were:

1. Overall quality of the workshop;
2. Importance of workshop material to the participants' jobs;
3. Usefulness of workshop material to participants when they return home;
4. Overall effectiveness of the lectures;
5. Effectiveness of teaching techniques;
6. Lecturer effectiveness in helping participants learn new skills and ideas;
7. Effectiveness of small group activities;
8. Effectiveness of visual aids;
9. Effectiveness of handouts, and
10. Participants' perceptions of the benefit of training to other extension workers.
11. Three most helpful topics identified by the participants.

In addition, participants were asked to identify the three most useful topics from both the extension and subject matter training. A comparison of the above listed factors was made between Week 1 and Week 2 of the workshop.

Participants were asked to give their perceptions in terms of a rating for each factor. Data were aggregated for analysis.

Conference organizers fixed the criterion for success for each factor studied at 70 per cent. In other words, if 70 per cent of the responses fell at or above the satisfactory level, then the criterion for success had been met. For example, in Question 1, 100 per cent of the participants rated the overall quality of the workshop for Week 1 as satisfactory or higher. Thus the criterion for success was met.

The results of the ratings for the major factors comparing Week 1 - extension training, and Week 2 - agricultural subject matter are presented in abbreviated form.

1. Overall quality of the workshop - Week 1 and 2:

One hundred (100) per cent of the participants rated both weeks as satisfactory or higher. Approximately 75 per cent of the respondents evaluated the quality of both Week 1 and 2 as excellent or outstanding.

2. Importance of workshop materials to the participants' jobs:

One hundred (100) per cent of the respondents rated this factor as important or higher for Week 1 and 96 per cent as important or higher for Week 2. A total of 94 per cent of the participants rated Week 1 as critical or very critical and 73 per cent rated Week 2 at that level. More DEO's and SMS's appeared to feel that the extension training was more critical for their jobs.

3. Usefulness of materials to participants when they return home:

Ninety per cent of the respondents indicated the usefulness of the extension materials covered as very useful and 80 per cent indicated the agricultural subject matter material as very useful. Comments indicated materials related to job related needs of the extension staff and those of farmers in their areas.

4. Effectiveness of the lectures:

Approximately 75 per cent of the participants rated the lecturers for both weeks training as very effective. Participants reported that horticulture lecturers should stress the backyard and middle farmer rather than commercial farmers.

5. Effectiveness of teaching techniques:

Approximately 70 per cent of the respondents indicated the effectiveness for both weeks as very effective. However, 18 per cent of the extension workers indicated teaching techniques for Week 2 as not effective as opposed to only 5 per cent for Week 1. A number of participants indicated that more demonstrations, field visitations, and visual aids should be used.

6. Lecturer effectiveness in helping participants learn new skills and ideas:

This question is closely related to Number 4. The difference relates to the lecturers' ability to help participants learn new ideas and skills. A total of 97 per cent of the respondents indicated the lecturers from Week 1 as being effective or very effective in helping them learn new ideas and skills. This contrasted to 89 per cent who indicated lecturers from Week 2 as being effective or very effective.

7. Effectiveness of small group activities in helping participants learn new skills and ideas:

There were more small group activities used during extension training. 87 per cent of the participants rated the effectiveness of small group activities during Week 1 as very effective as contrasted to 79 per cent for Week 2.

8. Effectiveness of visual aids in helping participants learn new knowledge:

91 per cent rated the effectiveness of visual aids used during Week 1 as effective or higher as contrasted to 93 per cent for Week 2.

9. Effectiveness of handouts in helping participants learn new information:

87 per cent of the extension workers reported the handouts used in Week 1 as being very effective in helping the participants learn new information. This compared with 80 per cent for Week 2.

10. Participants' perceptions of the benefit of the training for other extension workers:

All the participants felt that the extension and agricultural subject matter training would be beneficial to other extension workers.

11. Three most helpful topics identified by the participants:

Each extension worker was asked to name the three most useful extension and agricultural subject matter topics covered in the course. Extension topics most frequently mentioned were: motivation skills (19), communication skills (17), programme development (15), extension management (11), and philosophy of extension (9). Agricultural topics most frequently mentioned were: animal science (16), plant protection (12), range management (11), marketing (11), and farm machinery (11). Respondents defined helpfulness as new information relating to their professional needs. Briefly, the criterion of 70 per cent to judge the success of the workshop was met and exceeded in all cases. Based on this evidence one can make the judgement that both the extension and agricultural subject matter segments of the workshop were successful.

A second part of the evaluation was to assess a number of other factors involved in the workshop. Participants were asked to evaluate the overall effectiveness of the two-week educational endeavour.

1. Participants' assessment of the organization of the workshop:

73 per cent of the participants felt that the organization of the workshop was outstanding.

2. Participants' assessment of conference facilities:

37 per cent rated the facilities as outstanding and 63 per cent as satisfactory.

3. Teaching effectiveness of the lecturers:

This was a question double checking participant perceptions of teaching effectiveness in Week 1 and 2. A total of 74 per cent of the extension workers rated lecturer effectiveness as very effective. Some participants indicated some lecturers could use better techniques.

4. Participants' assessment of the value of information, ideas, and skills learned during the workshop:

91 per cent of all participants reported receiving some assistance or great assistance in terms of this factor.

5. Participants' assessment of personal progress toward learning new ideas and skills during training:

77 per cent of the participants indicated making good or

excellent progress toward learning new ideas and skills during the training.

6. Participants' assessment of knowledge and skills gained during the workshop compared to previous knowledge and skill base:

The results from this question were consistent with participant ratings of personal progress in the workshop. All participants reportedly gained knowledge and skills.

By any standards, the course was a success as judged by the participants in terms of all the significant factors. There was relatively little difference between the factors studied in terms of the extension and agricultural subject matter training. A slightly higher percentage of the respondents gave an edge to Week 1 in terms of: (1) importance of workshop materials to the participants' jobs, (2) effectiveness of teaching techniques, and (3) effectiveness of small group discussions.

This type of evaluation is limited to determining participant perceptions. These perceptions are mainly reactions to factors addressed in the questionnaire. Some assessment of participant attitudes is covered, primarily in a quantitative manner. Some qualitative data are provided by means of comments. Some evaluative feedback in terms of self-perception of knowledge and skills is also gained.

Conference coordinators observed that the participants practiced some skills and application of principles during small group discussions. This was specifically observed as part of the programme planning session where participants in teams of six developed a plan of work following the seven basic steps of the programme development cycle.

General recommendations from the participants for future courses included:

1. Include district extension personnel in an assessment of their training needs as a prelude to developing course content;

2. Provide training to lecturers to improve their techniques and use of visuals;

3. Provide more opportunity for participants to have "hands-on" experiences, field trips to relevant projects, opportunities to practice skills, and become involved in more active participatory work;

4. Schedule workshops of this type on an annual basis;

5. Consider training on a district or multi-district level, and

6. Provide similar training for other MOA officers (Matobo et al, 1982, pp. 4 - 12)*.

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* A more in-depth evaluation of this course was prepared immediately following its closure (Matobo and Trail, 1982). Evaluative data compiled by Matobo et al, 1982, used by permission of co-authors.

5.2.3 "Plant and soil science subject matter specialists' training" course

(a) Background

In July of 1982, twenty-six subject matter specialists were brought together in Maseru for a two-week training course denominated "Professional Improvement in Agricultural Extension". Subject matter specialists are those district-based staff of the Lesotho Ministry of Agriculture who frequently hold the Diploma in Agriculture from Lesotho Agricultural College, who have specialized in a given technical agriculture field and who provide subject matter support to extension personnel in the field. The instruction given in 1982 was thoroughly evaluated not only in terms of course content and impact but also with respect to perceived and continuing education needs (Matobo and Trial, 1982).

Much deliberation was given over to those studies during the ensuing months and the outcomes were reflected in the Research Extension Section's work plans for 1983 - 1984. In the meantime the Extension Division of MOA performed both formal and informal field-based assessments of productivity of field workers and their needs. Coming together at year's end, personnel from both Research Division and Extension Division of the Ministry of Agriculture and Marketing began to jointly plan continuing education and training events which would address the needs of subject matter specialists, and they did so on a national basis.

The FAO support staff for forestry in Lesotho and the Land Conservation and Range Development Project, along with their counterparts in MOA, pursued parallel plans to educate subject matter specialists in their respective subject matters. Much interdisciplinary work, formal and informal, resulted in FAO's jointly-sponsored forestry course, LCRD's* decision to proceed with a range and livestock course and Research Division's determination to give a mid-1983 short course for plant and soil science subject matter specialists. The Research Extension Section provided the leadership and organizational expertise for this effort in cooperation with Extension Conservation and Crops Divisions with logistical support from LAC.**.

(b) Implementation:

The week of August 1 - 5, 1983 was selected as the most appropriate time for the course as it is after vacations, during the annual break at LAC and just prior to planting season. LAC was selected as the venue because of its proximity to Research Division, its relative economy, and its mandated role in the continuing education of agricultural professionals. Also, LAC is able to provide dormitory and dining services in addition to instructional facilities and farm equipment. Extension Division personnel continued to assist research extension people in the design of course and instructional strategies. Research Division was called on to provide most of the instructional faculty, although both Crops and Conservation accepted and delivered two key lecturers. The faculty was composed of both national and expatriate professionals.

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* Land Conservation and Range Development

** Lesotho Agricultural College.

(c) Participants

27 subject matter specialists attended the course during the entire week. They were representative of all ten districts in Lesotho and of the several field disciplines related to plant and soil science. Most were holders of the Diploma in Agriculture, although a few were Certificate people. 23 participants were men, and four were women. Most made use of the facilities at LAC including the dormitories and dining rooms while a few lodged with relatives in Maseru. All transportation, food and lodging was financed by Farming Systems Research Project. Participants enjoyed the lecture hall facility at LAC for course opening and closing ceremonies, but elected to attend the majority of instructional events at the Research Division conference room.

(d) Curriculum

A representative of Crops Division was invited to open the course while the director of research gave the orientation. Agronomy Research lectured on soil fertility and fertilizer calculations while the deputy director of research delivered material on recommended agronomy varieties of maize, sorghum, wheat, beans and lentils for the mountains, foothills and lowlands of Lesotho. Horticulture Research lectured on the recommended varieties of winter and summer cabbages for the lowland, foothills and mountains and shared information about cultural operations for the recommended varieties of tomatoes. The director of research gave a three-part lecture and one field demonstration on potato production.

Extension Research lectured on continuing education for agricultural professionals and education formulae for solution of farmers' problems. Crops Division gave a day-long presentation on farm machinery, both in the classroom and on the land. Extension spoke about administrative matters in MOA and extension workers as facilitators. Extension Research instructed on group dynamics and group process.

Conservation delivered a comprehensive presentation on soil characteristics. Soil Research shared responsibility for information on soils and soil sampling techniques. Extension Research lectured on organization and maintenance of farmer contact groups. Agronomy Research contributed valuable information on weed control, utilizing herbicides as manual and mechanical control measures. Farm Management Research spoke on fruit-tree budgets and Marketing Research addressed marketing of vegetable crops.

(e) Evaluation

Extension Research administered an evaluative instrument designed by that section which also compiled and analyzed the data. The evaluative outcomes follow.

Respecting the strengths of the course, 17 participants found the lectures good, 19 felt that the discussion periods were most valuable, and 14 judged the instruction (in whatever form) excellent. There seems to be no really significant differences in these responses other than to take the signal to provide more and longer discussion periods in future courses.

Participants expressed their evaluation of topics taught. Horticulture (19) and soil fertility (17) were clearly favourites, while extension (11) and agronomy (11) were also favourably received. Soil conservation (6) and weed control (6) drew good response, and farm machinery (5), marketing (5) and farm management (5) sustained mild interest.

Reviewing what participants saw as course weaknesses, a few expressed no weaknesses. This sort of response was interpreted as a gesture of kindness to course organizers. Some singled out certain lectures as not well prepared. This may be true or may have reflected a discomfort with a questioning type of lecture delivery where part of the responsibility of the learning experience was placed with the participant. Many participants felt the time was too short. This is likely a valid point since so many deliveries were cut short and/or time for discussion was not available. Certainly subsequent short courses for SMS's should be two weeks long or shorter courses should be district based.

Some participants said they were not given hand-outs, lecturers were not punctual, and lecture preparation was poor. Mention was made of lecturers losing tempers when questioned. While all of these may be valid observations, they represent individual and not collective commentary.

So far as suggested improvements are concerned, most participants felt that an SMS course must be of two-week duration, with practicals.

Respecting knowledge not yet acquired at the end of the course (which might guide subsequent course content), participants expressed a continuing need on a declining scale as follows: agronomy (8), soil fertility (8), horticulture (5), extension (4), farm machinery (4) soil conservation (3), weed control (2), marketing (2), fodder production (2) and farm management (1).

Some participants wanted similar training to be conducted on a district level and others wanted to learn methods of approaching the extension assistants with SMS assistance.

On balance, the course seems to have demonstrated strength of both content and delivery. There were some weaknesses to be corrected or avoided. There was a clear indication of materials to be included in subsequent courses along with some good suggestions on instructional strategy (Youmans, 1983, pp. 2 - 6).

5.2.4. "The Extension Challenge": A course in extension methodology for district extension workers and subject matter specialists

(a) Introduction

After considerable reflection on the evaluative outcomes of earlier extension and subject matter specialist training, a field-based needs assessment was carried out country-wide between August 29 and September 28, 1983 in order to determine the extent and legitimacy of the oft-repeated request for district-based training in extension methods and practitioner skills. That needs assessment was also useful in determining the concise areas in extension methodology of greatest concern to field-based extension workers and subject matter specialists. Comprehensive responses were collected from Maseru, Mohale's Hoek, Berea, Butha Buthe, Quacha's Nek, Thaba Tseka and Leribe districts.

Extension Division personnel, along with representatives from Agricultural Information Services, were invited to screen the results of the needs assessment, help decide if country-wide training was in order, and assist in curriculum development.

The assessment was clearly positive and it was decided that Research Division farming systems research would undertake such training on national scale*. The scheme was presented to MOA and approved by the director of technical services. It was then forwarded to all district agricultural officers for indication of their willingness to provide the required venue, administrative support and released time in their respective districts. Ultimately, all ten districts responded positively, and the following schedule was released:

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* It was determined that the need for extension training based on the urgency to improve national farm productivity was not being met, and FSR/E and Research Division colleagues were called upon to conduct the training nationwide.

November 28 - December 2, 1983 ...	Qacha's Nek
December 6 - 9, 1983 ...	Mokhotlong
January 24 - 27, 1984 ...	Thaba Tseka
January 30 - February 2, 1984 ...	Maseru
February 27 - 29, 1984 ...	Berea
March 14 - 16, 1984 ...	Butha Buthe
March 19 - 21, 1984 ...	Mafeteng
March 27 - 30, 1984 ...	Leribe
April 3 - 6, 1984 ...	Mohale's Hoek
April 25 - 27, 1984 ...	Quthing

(b) Logistics

The logistical arrangements involved RD/FSR's* willingness to provide the instruction, pay the travelling costs of RD/FSR faculty and reimburse the R3 subsistence cost per day per out-of-district-seat participant. The districts agreed to provide a classroom at each site and to facilitate maximum participation by field-based personnel.

(c) Instruction

RD/FSR formed the travelling faculty to include the director of research, deputy director of research, research extension officer, expatriate extension specialist, research extension technical officer, research extension assistant and research livestock officer. Two officers from Agricultural Information

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* Research Division/Farming Systems Research

Services were invited to participate at their own expense. The curriculum was developed to contain instruction on:

1. Relation of research to extension;
2. Needs assessment techniques;
3. Group process and dynamics;
4. Organization and maintenance of farmer contact groups;
5. Communication skills;
6. Extension teaching methods;
7. Visual aids;
9. Motivation, and
9. Evaluation.

Evaluative instruments were developed in order to determine accomplishments.

(d) Implementation

In November, the schools were launched and, by April, had been conducted in all ten districts in Lesotho, the first nation-wide programme of its kind. A total of 272 extension workers and subject matter specialists were trained, and the research extension section gained national acclaim for this singular effort. They then conducted an eleventh school for national family planning, with 20 students in attendance at which were addressed the issues of:

1. Group process and dynamics;
2. Role of the field educator;
3. The communications process, and
4. The importance of reporting.

(e) Evaluation

The effectiveness of the schools, as perceived by the field extension workers, was determined by asking them to identify the strengths and weaknesses of the school, if subject matter was relevant, and how future schools could be improved.

The schools' strengths that were identified by the participants are shown in Table 5.1. These show a strong interest by the extension field workers in becoming more effective in meeting the needs of their clientele. The five strengths of the school most often cited dealt directly with improving personal capabilities and programmes. In contrast, only four per cent considered the segment on the relation of research to extension a strong point of the schools. The fact that ninety per cent of all participants completed a list of strengths is an indication of the high level of interest.

TABLE 5.1: STRENGTHS OF EXTENSION SCHOOLS, LESOTHO, 1985

Strength	Response Percentage*
Needs assessment techniques	28
Extension teaching methods	26
Communications skills	23
Motivation skills	22
Group process and dynamics	18
Effective listening techniques	12
Contact groups	11
Audio/visual aids	11
Relation of research to extension	4

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* Percentage shown is based on number of responses (283). Each participant was allowed to identify more than one strength.

** Table reproduced by permission of authors Youmans, Ramakhula and Lee (1985)

The weakness that was identified by thirty per cent of the extension workers was that the schools' duration was too short. Thirty-one per cent indicated the schools had no weakness. Lectures being too long was cited as a weakness by six per cent of the participants. No other particular weakness was cited by more than 2,5 per cent of the extension workers.

One hundred and thirty-seven responses (48,4%) indicated that the school addressed matters of real concern to them and their programme. Four (1,4%) indicated it did not contain relevant material.

Lengthening the duration of the schools was the most often recommended method of improving the instruction (17,3%) and including the same course twice a year was second (9,2%). Having a follow-up course and holding the course in farmer training centres were two suggested improvements identified in five per cent of the responses, although most courses were held at FTC's.

A second phase of the evaluation was designed to determine what extension methods field workers preferred in working with people in their districts. This was done by having them select, in order of preference, 5 of 21 extension methods. The results are shown in Table 5.2.

TABLE 5.2: SUMMARY OF RESPONDENTS' PREFERENCE OF EXTENSION METHODS IN PERCENTAGES* LESOTHO, 1985

Methods	RANKING				
	1	2	3	4	5
(Individual)					
Farm and home visits	62	9	9	6	5
Office calls	0	5	1	3	3
Telephone calls	0	0	1	0	0
Personal letters	**	3	3	1	2
Informal contacts	1	4	1	4	3
(Group)					
Meetings	14	22	8	6	4
Demonstrations	9	22	24	9	6
Tours, field trips	2	4	9	11	8
Group discussions	3	14	11	11	6
Extension schools	**	4	2	5	6
Farmer training centres	0	1	3	7	5
(Mass)					
Posters	1	4	7	5	7
Exhibits	1	1	4	7	11
Newspapers	0	1	2	2	4
Wall newspapers	**	**	0	2	2
Folders, leaflets, pamphlets	0	0	1	2	1
Fact sheets	0	0	1	**	1
Projected visuals	1	**	0	**	3
Radio	4	6	9	12	17
Television	**	0	0	1	0
Campaigns	0	**	5	5	8

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* Percentage based on total number of respondents, 272.

** Less than 0,5% (1 person) preferred this method.

*** Table reproduced by permission of authors Youmans, Ramakhula and Lee (1985).

Participating extension workers chose farm and home visits as their favourite method of transferring information. it was ranked in the top 5 of 21 choices by 91 per cent of the agents and 62 per cent placed it in first place. It was the only individual contact method that was highly regarded. The second choice in that category, informal contacts, was placed in the top five by 13 per cent of the respondents.

Overall, group contacts were preferred to either individual or mass media approaches. The six methods classified in this category received 47,2 per cent of the possible choices compared to 25,2 per cent for the five individual contact methods (18,2 per cent was for farm and home visits), and 27,6 per cent for the ten mass methods.

Use of demonstration was the most popular group contact method with 70 per cent of the participants ranking it in the top five, and 55 per cent placing it in the top three.

The use of meetings as a teaching method was placed in the top five categories by 54 per cent of the extension workers, group discussion 45 per cent, and tours and field trips by four per cent.

The use of radio was the most popular choice of the ten mass methods with 48 per cent of the respondents placing it in the top five. The use of posters and exhibits were both ranked in the top 5 by 24% of the participants. These three methods were in the top five choices because of the number of persons that ranked them in third, fourth or fifth place.

To determine if geographical location influenced preference of methods, an analysis was made of how extension workers from each of the ten districts ranked the six most popular methods. The number of respondents who ranked farm and home visits, demonstrations, meetings, group discussions, tours and field trips, and radio in their top three choices was calculated. This represented 80,7 per cent of possible choices for first, second, or third rankings. Results of this analysis are shown in Table 5.3.

There were no differences found that could be attributed to geographical location. Most of the districts followed the overall pattern, farm and home visits in first place demonstration and meetings a close second and third, and group discussions, radio, tours and field trips in fourth, fifth and sixth place, respectively.

Exceptions were Butha-Buthe and T Y that preferred group discussion to meeting. Also two districts in the southern

TABLE 5.3**: PREFERENCE OF SELECTED EXTENSION METHODS BY DISTRICTS, LESOTHO, 1985

	Methods *					
District	F & H Visits	Demo	Meetings	Group Disc	Tours	Radio
Maseru	68	58	48	6	16	29
T Y	88	61	27	39	19	21
Leribe	91	51	42	27	12	6
Butha Buthe	93	55	35	55	17	10
Mafeteng	67	56	72	17	17	22
Mohale's Hoek	65	85	40	10	20	10
Quthing	57	57	38	29	19	29
Qacha's Nek	91	39	57	35	4	30
Thaba Tseka	78	46	49	22	11	22
Mokhotlong	87	67	53	7	27	13

* Values listed represent the percentages of respondents in each district that ranked these 6 methods in their first 3 choices.

** Table reproduced by permission of authors Youmans Ramakhula and Lee (1985).

part of the country, Mafeteng and Mohale's Hoek, ranked farm and home visits lower than the average and demonstration or meetings considerably higher than the average. The extension agents at Quthing as a group gave farm and home visits the lowest ranking of any district (57%). Reasons for the difference among districts could not be determined from available information, however, it is very likely previous experience of extension workers influenced their choice of methods.

(f) Conclusions

Reflections of both process and evaluation elucidated a number of brief conclusions. Extension and other district-based personnel of Lesotho's Ministry of Agriculture needed and responded positively to a programme of continuing education. High levels of attendance and evaluative response were experienced. The similarity of evaluative responses from all districts regardless of population or location was notable.

The schools seem to have been valuable in terms of overall continuing education needs of the ministry as borne out by the comments respecting improvements for the programme. Those constructively critical remarks provided a valuable information base for planning subsequent educational experiences (Youmans, Ramakhula and Lee, 1985).

5.2.5. Continuing programmes

The 1984 - 1985 programme year saw an on-going programme of ten agricultural schools organized by Extension Research/FSR personnel in cooperation with Research, Range, Conservation and Livestock Divisions plus the Land Use Planning Section of the Ministry of Agriculture (Sefeane and Ramakhula, 1985). The outcomes of this programme do not fall within the scope of this study.

The above represents a detailed report of the extension education programmes executed by the Research Division in the FSR context in response to the continuing education needs of district-based extension workers and subject matter specialists. These programmes have been adequately evaluated through the first four evidence levels of inputs, activities, people involvement and reactions as per Bennett (1980).

5.3 THE RESEARCH PROBLEM

Regardless of the information known and documented above, the Research Division and the FSR Project need to further ascertain the impacts of these extension education programmes at the upper three evidence levels. Otherwise stated, there is a need to know the perceived changes in the KASA realm (knowledge, attitudes, skills and aspirations), in professional practice, and in end results which have occurred among extension workers and subject matter specialists as a result of having participated in the FSR extension education programmes.

5.4 METHODOLOGY

Again the reflective appraisal of programme (RAP) methodology will be used to accomplish this investigation as described by Bennett (1982). As has been seen, this approach to the study of clientele-perceived results of extension programmes is a state-of-the-art methodology which employs an interview/questionnare based on standardized but modifiable questions designed to elicit reflective perceptions from people about extension programmes in which they have participated. Building on works about analysis of impacts (Bennett, 1976) and evidence levels (Bennett, 1980), RAP seeks subjective evidence about extension programme outcomes which may be quantified and analyzed like any other data. Far from being apologetic about the subjectivity of the raw data, proponents of RAP argue that all learning is perception and the most common way to find out what people have learned and how they have changed as a result of having participated in extension programmmes is to ask them.

RAP enables extension practitioners to evaluate their own programmes by means of reflective perception determinations. It recognizes the danger of bias in subjective evaluative methods and seeks to prevent and/or reduce the sources of same by careful selection and training of evaluators, restricting the scope of RAP studies, expanding the standardized core of the RAP methodology as required to add substance to the data, use of probe questions to clarify or verify standard answers, and encouraging balanced presentation of negative as well as positive probe responses.

RAP allows for the use of interviews, review and analysis of documents, observation, and expert opinion, as well as questionnaire data, in the interpretation of findings. All these alternative methods will be amply used in this study.

The steps in the RAP process include developing a rationale for evaluating extension education outcomes, selecting a programme for study, identifying the consumers and users of a RAP study, defining the scope of the study, identifying the interviewers, preparing the data collection instrument, interviewing the participants, analyzing and presenting the findings, making conclusions and recommendations, and communicating the findings.

Any number of data interpretation procedures are available to the RAP researcher. Bennett, (1976) speaks of proxy measures, field experiments, matched set designs, time-trend studies, before-after studies, surveys, and case studies*. These are, of course, complemented by several graphic techniques (Yang, 1955) and many statistical and computer-assisted techniques (Leedy, 1974). The choice of specific presentation techniques to be used in this chapter is associated directly with the characteristics of the data involved. They are described fully in Section 5.6).

5.5 DATA COLLECTION

Central and critical to the RAP methodology and to this study is data collection and the design and use of the data collection instrument. Consistent with methodological guidelines by Bennett (1982), four questionnaires were developed in order to secure data at KASA (knowledge, attitudes, skills and aspirations), practice change and end results evidence levels, as per Bennett (1980), from participants in all four courses for extension workers and subject matter specialists described under 5.2. These were the Mazenod course, the Airport course, the RD/LAC course, and the ten district-based extension schools.

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* Bennett earlier suggested ways of dealing with data collected on the same evidence levels used in RAP.

On each questionnaire, the programme to be evaluated was briefly described and the purpose of the interview explained. A set of biographical data was collected. Inputs and people involvement were briefly reviewed. The content of each course was included to refresh recall and a validation of content included. A reaction question was asked along with a methods preference question. Essentially, this initial part of the questionnaire was designed to verify, validate and reconfirm information generally known about the extension education programmes. Standardized but modifiable questions were asked on the content of each programme in order to determine changes in knowledge, attitudes, skills and aspirations (KASA), practice and end results perceived by participants as outcomes of the programmes. In all cases standardized responses were followed up by probe questions designed to clarify, verify or challenge the initial responses. Finally, recommendations for the improvement of the programmes were asked of each respondent. The instrument was developed in English and was tested with three participants and modified with respect to some biographical questions before its use in the field.

The principal researcher (white male expatriate FSR extension specialist) and the research assistant (a Mosotho female research assistant)* conducted personal interviews and recorded all data on the questionnaire forms except the recommendations, which were written by the respondents themselves. The interviews were conducted in English between November 1984 and March 1985 concurrently with extension agricultural schools in the ten districts. The entire populations of the participants in the Mazenod, Airport, and RD/LAC courses were targeted for interviews along with a sample of 67 persons of the 272 recorded full-time participants in the district-based extension schools. This sample was determined by selecting every fourth name on the full-name attendance lists. It was felt that there was essentially no difference between the expatriate male and the national female interviewer in terms of vested interest in programme outcomes, that the balance achieved between difference in sex, race, and culture was favourable and that responses to interviews were generally congenial and open.

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* Described earlier.

By April 1985, completed questionnaires were in the hands of the principal researcher for presentation and further analysis. Of the 31 participants in the Mazenod course, 21 returned completed questionnaires. The 30 participants in the Airport course produced 20 respondents. A response of 18 was procured among the 27 full-time participants in the RD/LAC course. And of the target sample of 67 of the 272 full-time participants in the district-based schools, 47 rendered completed questionnaires.

5.6 PRESENTATION AND ANALYSIS OF DATA

In order to determine the impacts of FSR extension education programmes on district-based extension workers and subject matter specialists, the outcomes of the four separate courses described earlier in this chapter are assessed both individually and collectively. Biographical data are examined collectively to render a general profile of field staff. Information at the inputs, people involvement, and reactions levels is also seen collectively to draw some general deductions from that exercise. The activities themselves are analyzed separately for KASA and practice change findings since the audiences, course content, and expected outcomes are different. Examples of practice change and recommendations are again grouped since variability is not expected among the outcomes of the four courses. End results are neither compiled nor analyzed since end results of practice change implemented by extension workers and subject matter specialists can only become manifest in induced change among farmers and home managers. While there is some early evidence of such induced change in this chapter, the data are not conclusive.

5.6.1 Biographical data

Of the fifteen questions asked respondents in this general category, just four were selected for further description. They are sex, age, length of ministry service and level of formal agricultural education. While some respondents are known to have attended more than one course, and may have thus rendered more than one completed questionnaire, their personal data is thought not to be significantly different from a like number of field workers who attended no course at all. Thus, no differentiation was attempted. Findings follow.

a. Sex

Of the 106 respondents, representative of participants in all four courses, 74 (70%) were men and 32 (30%) were women.

b. Age

The mean age for male participants was 40, while the mean age for females attending all courses was 31. The mean age of the total sample was 37. The most prominent age interval for all participants as well as for men was 33 - 37, while the highest frequency among women was in the 43 - 47 interval. These data can be seen in Figure 5.1.

c. Years of service

Responding to a question regarding years of service with the Ministry of Agriculture, male participants reported a mean of 14,7 years, while females accounted for a mean of 7,2 years. Mean years of service for the total sample was 12 years. When MOA experience for all respondents is expressed in graphic percentages (Figure 5.2), it can be seen that most fall into the 6 - 9 year experience frequency with the 2 - 5 year frequency a close second. It is suspected that the high incidence of respondents in those frequencies is related to newly appointed extension assistants, among them many women. Interestingly, the third most populous frequency is that of 18 - 21 years of MOA service. Why it should exceed the 10 - 13 year interval, and dramatically surpass the 14 - 17 year interval, is not evident from the

FIGURE 5.1: AGE CHARACTERISTICS OF EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS ATTENDING EXTENSION EDUCATION COURSES, LESOTHO, 1985

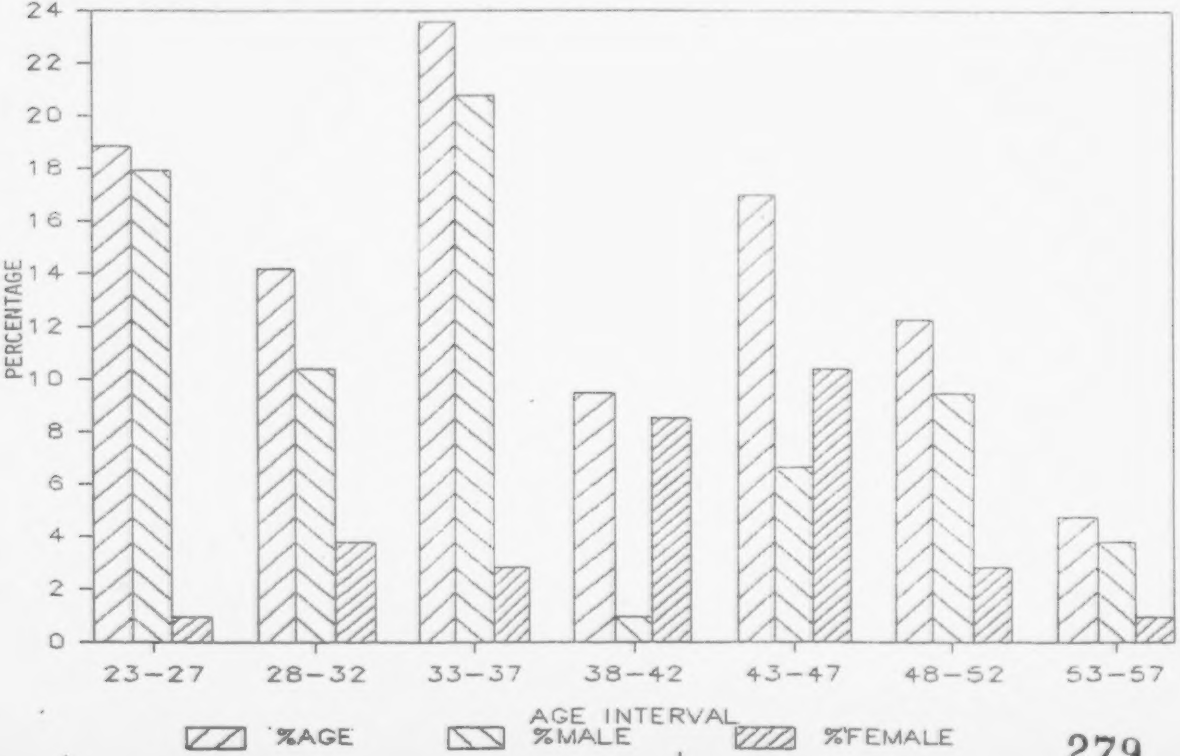
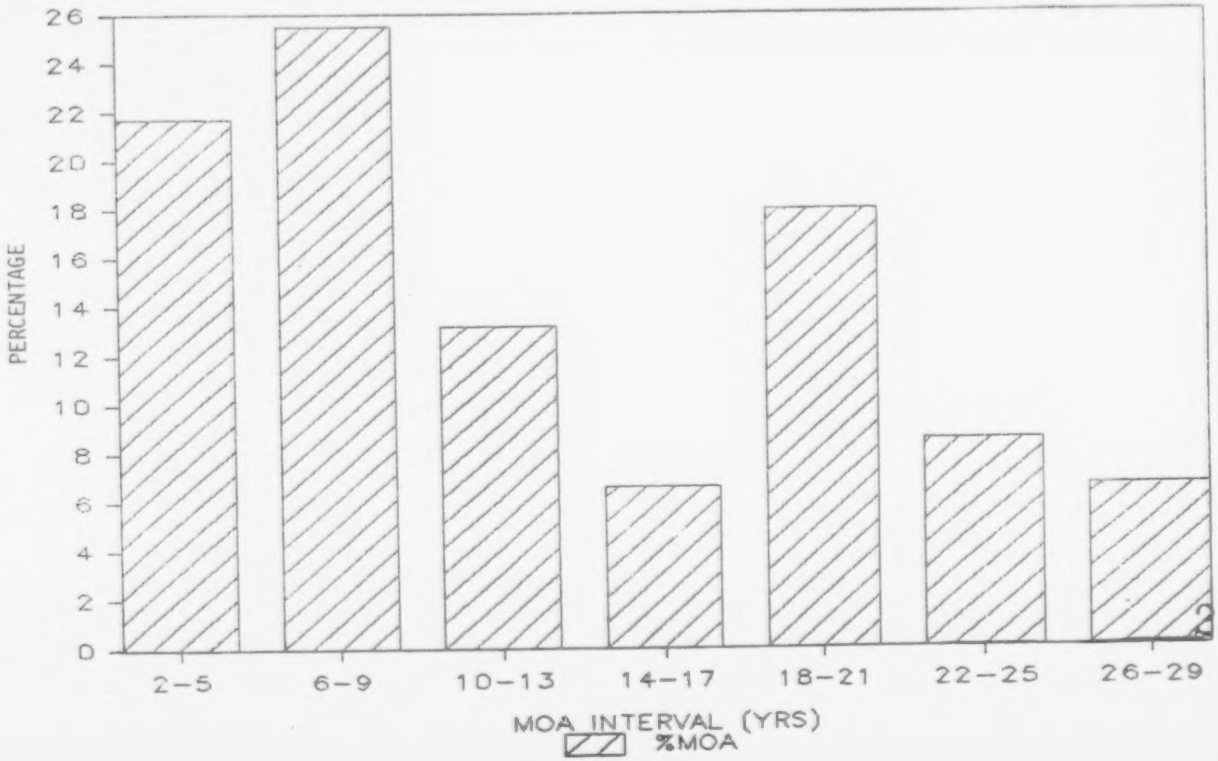


FIGURE 5.2: YEARS OF SERVICE WITH MINISTRY OF AGRICULTURE OF PARTICIPANTS IN EXTENSION CONTINUING EDUCATION COURSES, LESOTHO, 1985



data at hand. Employment cycles by government in general and child rearing by women may have some influence on this configuration.

d. Formal agricultural education

Of the 106 respondents in the four samples 71 (67%) hold the Certificate in Agriculture credential and 33 (31%) have the Diploma in Agriculture (or in a specialized field). The two others (2%) who hold neither of these credentials were older men who had begun their government service on the strength of secondary school qualifications. The vast majority of the credentials reported were from Lesotho Agricultural College.

5.6.2 Validation of course(s) content

Among the 106 total respondents, 54 (51%) said that according to their recollection of the course(s), the course content as described in the questionnaire(s) was accurate so far as they knew. Another 47 persons (44%) said the course content as described was reasonably accurate. Course content was not remembered by four respondents (4%).

5.6.3 Reaction level(s)

The sample was asked to what extent the course(s) met their expectations at the time. A majority of 69 respondents (65%) said the course(s) had met their expectations to a great extent. A second group of 28 persons (26%) reported that they had done so to a fair extent. Yet a third sub-sample of six persons (6%) said their expectations had been met to a slight extent, while two persons (2%) did not know.

5.6.4 Extension education methods

The 47 respondents to the district-based "The Extension Challenge" course (44%) were not asked to rate extension continuing education methods since their course employed but a single method, the illustrated lecture. However, the other 59 respondents were asked to rate their personal preferences among illustrated lectures, demonstrations, field trips, group discussions and audio-visual aids as instructional methods as applied to their own continuing education. The illustrated lecture was the preference of 26 respondents (44%), demonstrations were preferred by 14 (24%), field trips were the first choice of 13 people (22%), four (4) respondents (7%) chose audio-visual aids and a single (1) respondent (2%) preferred group discussions.

5.6.5 KASA and practice change for the Mazenod course

In order to interpret the KASA and practice change information in Table 5.4 and in Figures 5.3 - 5.6, the following keys are necessary.

a. Key to topics

1. Extension in Lesotho
2. Your organization
3. Cultural constraints
4. Lay leadership
5. Motivation
6. Programme evaluation
7. Appropriate technology
8. Agronomy
9. Soils
10. Forestry
11. Communications skills
12. Programme development cycle
13. Teaching agriculture
14. Village agricultural committees
15. Farming systems research methods
16. Farm management
17. Marketing
18. Range ecology

TABLE 5.4: KASA AND PRACTICE CHANGE SCORES FOR EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS IN RAW RESPONSES FOR THE MAZENOD COURSE, LESOTHO, 1985

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	12	7	1	1	0	10	9	1	1	0	9	8	3	1	0	12	8	0	1	0	7	10	3	1	0
2	9	6	4	2	0	6	11	2	2	0	7	9	3	1	1	13	3	3	1	1	4	13	1	1	2
3	10	7	2	2	0	5	10	3	2	1	6	9	4	2	0	7	9	3	2	0	8	8	3	2	0
4	10	9	1	1	0	11	9	0	1	0	7	11	2	1	0	12	7	1	1	0	8	10	2	1	0
5	14	4	1	2	0	13	6	0	2	0	12	6	1	2	0	15	2	2	2	0	9	7	3	0	2
6	8	8	4	1	0	9	9	2	1	0	5	11	4	1	0	13	5	2	1	0	5	9	5	1	1
7	7	8	2	4	0	7	8	2	4	0	2	10	5	4	0	7	6	3	4	1	2	9	4	1	5
8	10	8	0	3	0	11	7	0	3	0	9	7	2	3	0	11	7	0	3	0	8	10	0	1	2
9	7	6	7	1	0	8	7	4	1	1	7	5	7	1	1	8	6	5	1	1	5	4	7	2	3
10	6	6	8	1	0	7	8	4	2	0	6	8	4	1	2	8	6	3	2	2	6	5	4	2	4
11	17	4	0	0	0	17	4	0	0	0	17	3	1	0	0	15	5	1	0	0	13	6	1	0	1
12	5	5	4	7	0	6	8	0	7	0	5	7	2	7	0	4	8	2	7	0	4	5	5	3	4
13	11	6	1	3	0	13	4	1	3	0	10	8	0	3	0	14	3	1	3	0	9	8	1	2	1
14	12	6	1	2	0	13	5	1	2	0	11	8	0	2	0	12	6	1	2	0	7	10	1	1	2
15	10	6	2	3	0	11	5	2	3	0	10	6	2	3	0	11	6	1	3	0	6	7	5	2	1
16	4	10	4	3	0	7	8	3	3	0	6	9	3	3	0	8	6	4	3	0	4	8	5	2	2
17	6	5	6	4	0	4	7	5	5	0	3	7	7	4	0	4	6	6	4	1	3	5	5	2	6
18	8	5	5	1	2	11	4	3	2	1	4	8	6	1	2	5	8	5	1	2	2	8	7	1	3

TABLE 5.4 (CONT'D): KASA AND PRACTICE CHANGE SCORES FOR EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS IN PERCENTAGES FOR THE MAZENOD COURSE, LESOTHO, 1985

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	57	33	5	5	0	48	43	5	5	0	43	38	14	5	0	57	38	0	5	0	33	48	14	5	0
2	43	29	19	10	0	29	52	10	10	0	33	43	14	5	5	62	14	14	5	5	19	62	5	5	10
3	48	33	10	10	0	24	48	14	10	5	29	43	19	10	0	33	43	14	10	0	38	38	14	10	0
4	48	43	5	5	0	52	43	0	5	0	33	52	10	5	0	57	33	5	5	0	38	48	10	5	0
5	67	19	5	10	0	62	29	0	10	0	57	29	5	10	0	71	10	10	10	0	43	33	14	0	10
6	38	38	19	5	0	43	43	10	5	0	24	52	19	5	0	62	24	10	5	0	24	43	24	5	5
7	33	38	10	19	0	33	38	10	19	0	10	48	24	19	0	33	29	14	19	5	10	43	19	5	24
8	48	38	0	14	0	52	33	0	14	0	43	33	10	14	0	52	33	0	14	0	38	48	0	5	10
9	33	29	33	5	0	38	33	19	5	5	33	24	33	5	5	38	29	24	5	5	24	19	33	10	14
10	29	29	38	5	0	33	38	19	10	0	29	38	19	5	10	38	29	14	10	10	29	24	19	10	19
11	81	19	0	0	0	81	19	0	0	0	81	14	5	0	0	71	24	5	0	0	62	29	5	0	5
12	24	24	19	33	0	29	38	0	33	0	24	33	10	33	0	19	38	10	33	0	19	24	24	14	19
13	52	29	5	14	0	62	19	5	14	0	48	38	0	14	0	67	14	5	14	0	43	38	5	10	5
14	57	29	5	10	0	62	24	5	10	0	52	38	0	10	0	57	29	5	10	0	33	48	5	5	10
15	48	29	10	14	0	52	24	10	14	0	48	29	10	14	0	52	29	5	14	0	29	33	24	10	5
16	19	48	19	14	0	33	38	14	14	0	29	43	14	14	0	38	29	19	14	0	19	38	24	10	10
17	29	24	29	19	0	19	33	24	24	0	14	33	33	19	0	19	29	29	19	5	14	24	24	10	29
18	38	24	24	5	10	52	19	14	10	5	19	38	29	5	10	24	38	24	5	10	10	38	33	5	14

FIGURE 5.3: KNOWLEDGE CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985

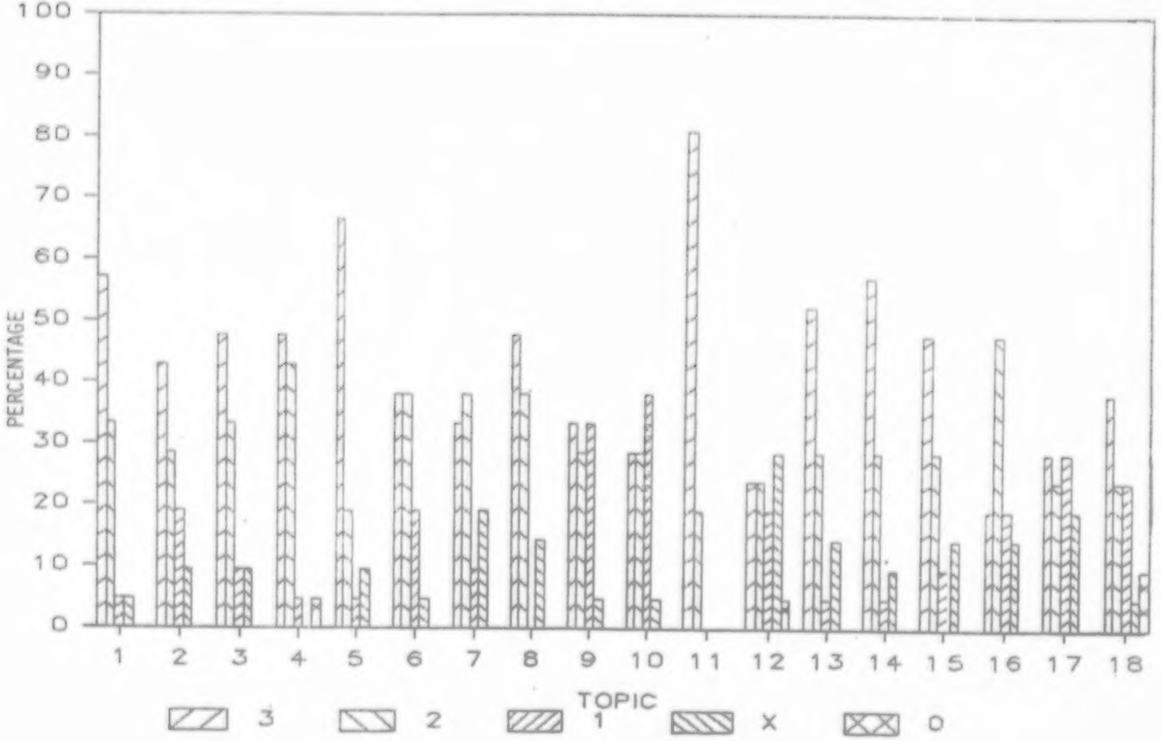


FIGURE 5.4: ATTITUDE CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985

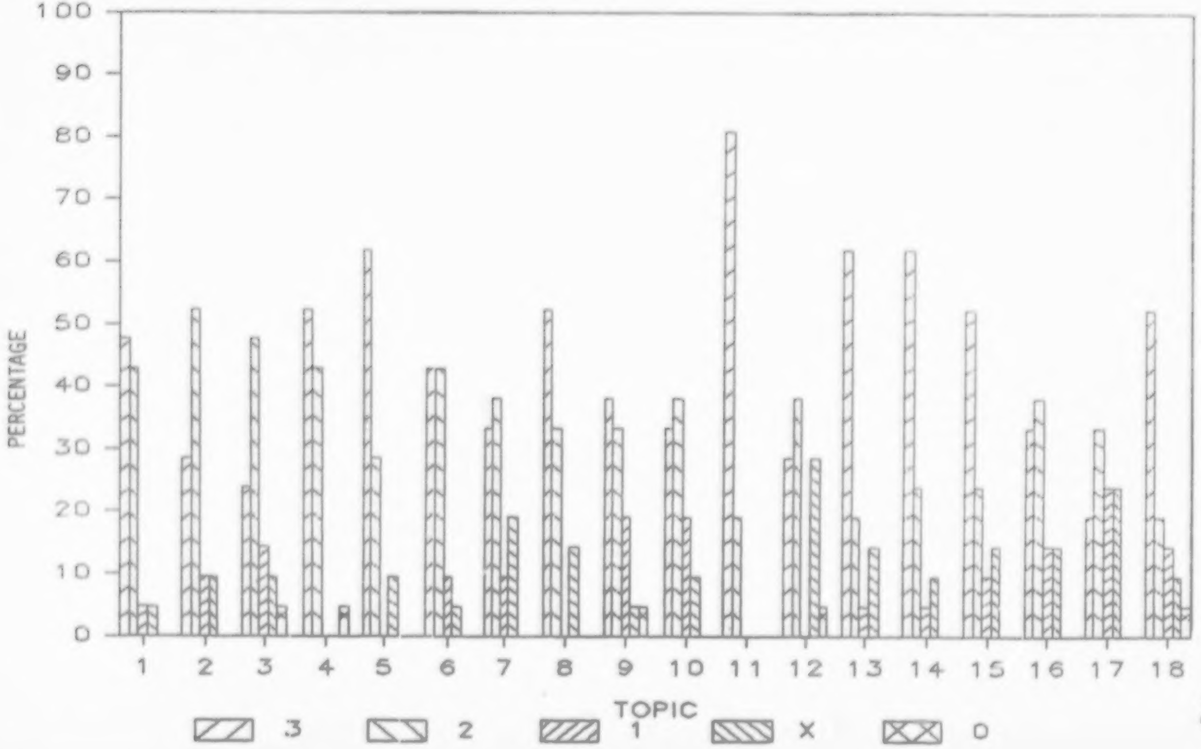
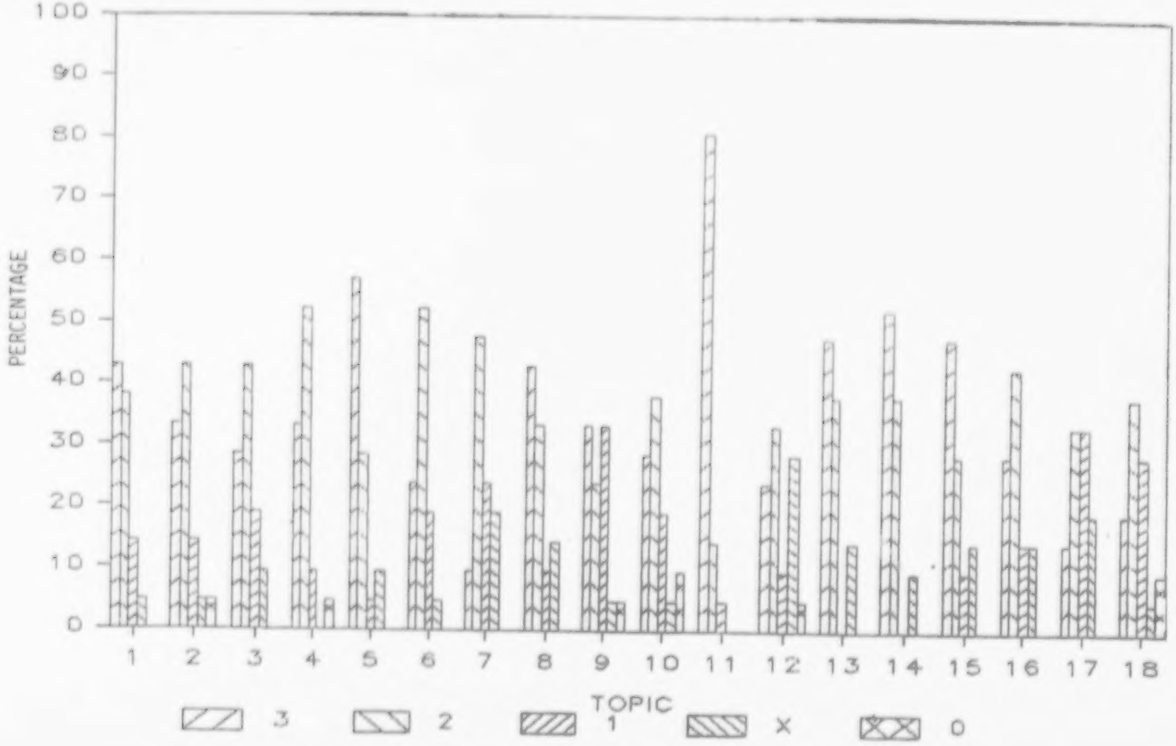


FIGURE 5.5: SKILLS CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985



b. Key to responses

- to a great extent	(3)
- to a fair extent	(2)
- to a slight extent	(1)
- don't know/don't recall	(X)
- not at all	(0)

Response scores and their corresponding percentage values can be seen in Table 5.4.

c. KASA change

It is clear that there is a great deal of variability in the KASA responses of this sample, indicating a more discriminating and demanding clientele. Scores still tended toward the "3" response level for most topics taught, although "2" responses appear in significant frequencies. There are also modest "1", "X" and "0" responses. The scores indicate generally that most respondents reported KASA gains to a great or fair extent. However, moderate numbers indicated slight or no gains with a few respondents claiming negligible recall.

The data indicate that very high KASA responses were reported by the Mazenod course clientele in such subject matters as communications skills, motivation, extension in Lesotho village agricultural committees and teaching agriculture, while relatively few high responses were recorded for such instructional areas as farm management, programme development cycle and marketing. Moderately high responses were seen for a wide variety of topics to include cultural constraints, lay leadership, agronomy, farming systems research and the extension organization.

It is to be remembered that these scores relate to the relative perceived gains made by participants in their knowledge, attitudes, skills and aspirations in the eighteen topics taught. The data can be seen graphically in Figures 5.3 - 5.6.

d. Practice change

Practice change scores for this same group can also be seen on Table 5.4. There is much more general variability in reports of practice change as compared to KASA change with respondents indicating "fair" amounts of change in the greater number of cases. Practice changes reported as "great" were less frequent, and moderate levels of "slight", "don't know" and "none" responses were seen. This is the expected configuration since practice change is known to be more difficult to achieve than are, for example, gains in knowledge and skills. Likewise, practice change among extension workers to a considerable extent, depends on the cooperation of their respective farmer clienteles. Practice change for subject matter specialists, similarly, depends on the receptiveness of extension workers.

The configuration again shows positive practice change in communications skills and extension organization, moderate change in extension, lay leadership, agronomy, teaching agriculture, and village agricultural committee work, and low change levels in forestry, programme development, and marketing. This configuration is seen on Figure 5.7.

5.6.6 KASA and practice change for the Airport Hotel course

Again keys are required to interpret the data presented in Tables 5.5, 5.6 and 5.7.

a. Key to subject matters

1. Philosophy of extension
2. Agronomy in Lesotho
3. Effective listening
4. Extension management

FIGURE 5.7: PRACTICE CHANGE FOR PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985

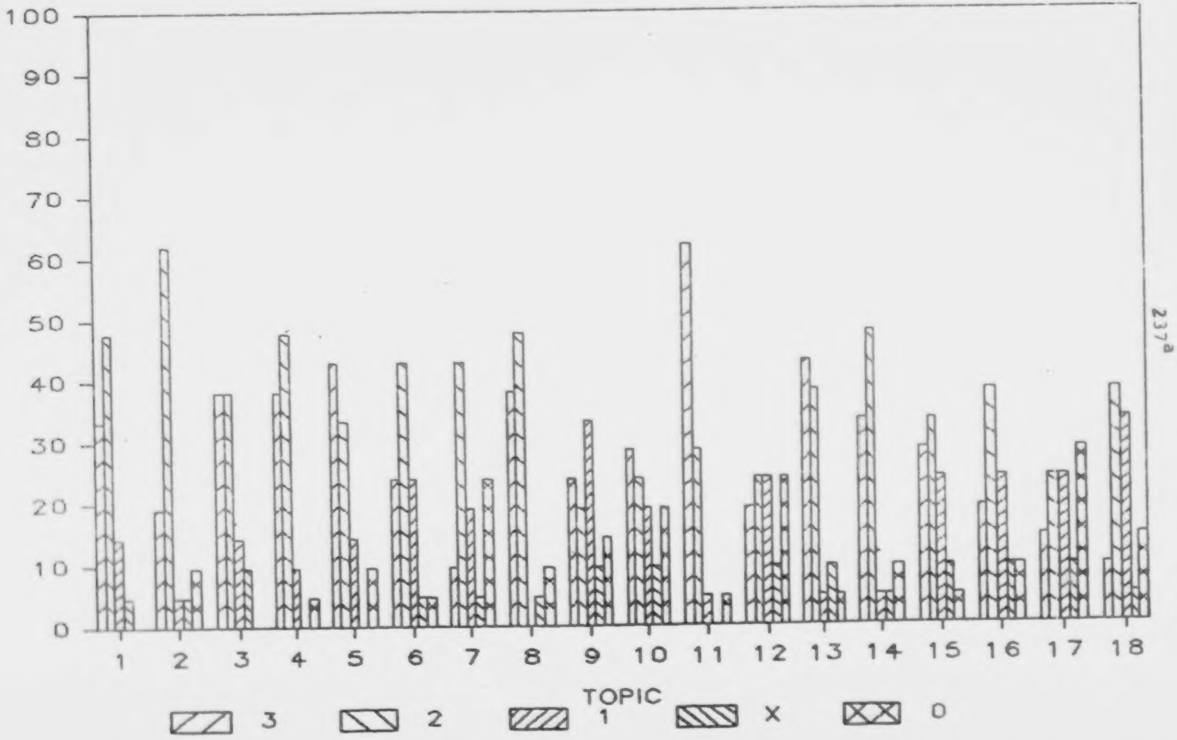


TABLE 5.5: TOTAL KASA AND PRACTICE CHANGE RESPONSES FOR ALL TOPICS BY PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, LESOTHO, 1985

	TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC CHANGE				
	NUMBE	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
E	1	30	50	10	10	0	35	55	0	10	0	0	65	20	15	0	20	60	5	15	0	20	45	25	5	5
A	2	25	35	25	5	10	30	40	20	0	10	10	55	15	10	10	15	60	15	0	10	10	45	30	5	10
E	3	35	65	0	0	0	55	35	10	0	0	40	45	15	0	0	25	65	10	0	0	35	40	25	0	0
E	4	35	35	10	20	0	30	50	0	15	5	20	45	15	20	0	25	55	0	15	5	10	50	20	15	5
E	5	15	30	45	10	0	20	25	45	10	0	10	25	55	10	0	15	20	50	10	5	10	30	35	15	10
E	6	50	30	15	0	5	50	30	20	0	0	30	50	20	0	0	30	50	20	0	0	45	25	25	0	5
E	7	65	10	25	0	0	55	25	20	0	0	35	25	35	5	0	45	40	15	0	0	35	40	25	0	0
E	8	35	20	25	5	15	40	15	25	5	15	35	15	25	5	20	40	25	20	5	10	35	15	20	5	25
E	9	40	35	25	0	0	55	25	15	5	0	45	35	15	5	0	35	40	20	5	0	50	20	25	5	0
E	10	25	45	10	15	5	25	35	20	15	5	20	35	20	15	10	30	25	20	15	10	5	35	30	20	10
A	11	45	10	25	0	20	35	25	20	0	20	30	30	25	0	15	30	30	20	0	20	25	20	25	0	30
A	12	20	20	30	10	20	30	10	30	10	20	25	15	30	10	20	25	20	20	10	25	25	15	20	10	30
A	13	25	40	30	0	5	30	50	15	0	5	25	30	30	0	15	25	45	20	0	10	25	25	25	5	20
A	14	15	55	15	0	15	40	30	20	0	10	15	40	25	0	20	30	35	25	0	10	10	35	20	5	30
A	15	35	50	10	0	5	30	55	10	0	5	35	40	20	0	5	35	45	15	0	5	35	35	20	0	10
E	16	40	35	15	10	0	40	20	25	15	0	25	30	30	15	0	30	30	20	20	0	20	40	10	20	10
E	17	35	35	10	15	5	55	30	5	5	5	30	40	10	15	5	30	50	10	5	5	30	35	15	15	5
E	18	70	25	5	0	0	60	35	5	0	0	40	45	15	0	0	45	45	10	0	0	50	35	15	0	0
A	19	45	35	15	5	0	45	50	0	5	0	30	45	15	5	5	30	40	20	5	5	30	40	15	10	5
E	20	50	25	15	10	0	40	30	20	10	0	35	30	25	10	0	50	15	25	10	0	45	10	35	5	5
E	21	50	30	15	0	5	65	20	15	0	0	45	30	15	0	10	50	25	10	0	5	40	35	15	0	10
E	22	25	35	20	15	5	20	30	25	15	10	20	35	20	15	10	20	25	35	15	5	25	20	30	10	15
E	23	65	20	10	5	0	50	25	15	0	10	45	35	15	5	0	40	40	15	0	5	40	35	15	0	10
E	24	25	40	15	20	0	25	30	15	20	10	20	40	15	20	5	25	35	15	20	5	20	40	15	15	10
E	25	55	35	10	0	0	45	45	5	0	5	40	50	10	0	0	55	35	10	0	0	30	45	20	0	0
A	26	35	25	15	15	10	25	30	10	20	15	20	20	30	20	10	25	5	35	20	15	15	20	25	20	25
A	27	30	30	15	10	15	25	40	10	5	20	20	30	20	5	25	25	30	15	5	25	20	20	30	5	25
A	28	30	25	25	5	15	25	30	20	10	15	10	40	20	10	20	15	35	20	10	20	10	20	30	10	30
A	29	40	10	25	10	15	40	15	25	5	15	30	15	30	5	20	30	25	25	5	15	15	35	20	5	25
A	30	30	30	15	5	20	35	20	10	5	15	20	30	15	15	20	20	40	15	5	20	15	25	15	10	35

TABLE 5.6: TOTAL KASA AND PRACTICE CHANGE RESPONSES IN PERCENTAGES BY PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, TOPICS IN ORDER OF PRESENTATION, LESOTHO, 1985

	TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
	NUMBE	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
E	1	6	10	2	2	0	7	11	0	2	0	0	13	4	3	0	4	12	1	3	0	4	9	5	1	1
A	2	5	7	5	1	2	6	8	4	0	2	2	11	3	2	2	3	12	3	0	2	2	9	6	1	2
E	3	7	13	0	0	0	11	7	2	0	0	8	9	3	0	0	5	13	2	0	0	7	8	5	0	0
E	4	7	7	2	4	0	6	10	0	3	1	4	9	3	4	0	5	11	0	3	1	2	10	4	3	1
E	5	3	6	9	2	0	4	5	9	2	0	2	5	11	2	0	3	4	10	2	1	2	6	7	3	2
E	6	10	6	3	0	1	10	6	4	0	0	6	10	4	0	0	6	10	4	0	0	9	5	5	0	1
E	7	13	2	5	0	0	11	5	4	0	0	7	5	7	1	0	9	8	3	0	0	7	8	5	0	0
E	8	7	4	5	1	3	8	3	5	1	3	7	3	5	1	4	8	5	4	1	2	7	3	4	1	5
E	9	8	7	5	0	0	11	5	3	1	0	9	7	3	1	0	7	8	4	1	0	10	4	5	1	0
E	10	5	9	2	3	1	5	7	4	3	1	4	7	4	3	2	6	5	4	3	2	1	7	6	4	2
A	11	9	2	5	0	4	7	5	4	0	4	6	6	5	0	3	6	6	4	0	4	5	4	5	0	6
A	12	4	4	6	2	4	6	2	6	2	4	5	3	6	2	4	5	4	4	2	5	5	3	4	2	6
A	13	5	8	6	0	1	6	10	3	0	1	5	6	6	0	3	5	9	4	0	2	5	5	5	1	4
A	14	3	11	3	0	3	8	6	4	0	2	3	8	5	0	4	6	7	5	0	2	2	7	4	1	6
A	15	7	10	2	0	1	6	11	2	0	1	7	8	4	0	1	7	9	3	0	1	7	7	4	0	2
E	16	8	7	3	2	0	8	4	5	3	0	5	6	6	3	0	6	6	4	4	0	4	8	2	4	2
E	17	7	7	2	3	1	11	6	1	1	1	6	8	2	3	1	6	10	2	1	1	6	7	3	3	1
E	18	14	5	1	0	0	12	7	1	0	0	8	9	3	0	0	9	9	2	0	0	10	7	3	0	0
A	19	9	7	3	1	0	9	10	0	1	0	6	9	3	1	1	6	8	4	1	1	6	8	3	2	1
E	20	10	5	3	2	0	8	6	4	2	0	7	6	5	2	0	10	3	5	2	0	9	2	7	1	1
E	21	10	6	3	0	1	13	4	3	0	0	9	6	3	0	2	10	5	2	0	1	8	7	3	0	2
E	22	5	7	4	3	1	4	6	5	3	2	4	7	4	3	2	4	5	7	3	1	5	4	6	2	3
E	23	13	4	2	1	0	10	5	3	0	2	9	7	3	1	0	8	8	3	0	1	8	7	3	0	2
E	24	5	8	3	4	0	5	6	3	4	2	4	8	3	4	1	5	7	3	4	1	4	8	3	3	2
E	25	11	7	2	0	0	9	9	1	0	1	8	10	2	0	0	11	7	2	0	0	6	9	4	0	0
A	26	7	5	3	3	2	5	6	2	4	3	4	4	6	4	2	5	1	7	4	3	3	4	5	4	5
A	27	6	6	3	2	3	5	8	2	1	4	4	6	4	1	5	5	6	3	1	5	4	4	6	1	5
A	28	6	6	5	1	3	5	6	4	2	3	2	8	4	2	4	3	7	4	2	4	2	4	6	2	6
A	29	8	2	6	2	3	8	3	5	1	3	6	3	6	1	4	6	5	5	1	3	3	7	4	1	5
A	30	6	6	3	1	4	7	4	2	1	3	4	6	3	3	4	4	8	3	1	4	3	5	3	2	7

TABLE 5.7: TOTAL KASA AND PRACTICE CHANGE RESPONSES IN PERCENTAGES BY PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, TOPICS SEGREGATED INTO AGRICULTURE AND EXTENSION, LESOTHO, 1985

	TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
	NUMBE	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
A	26	7	5	3	3	2	5	6	2	4	3	4	4	6	4	2	5	1	7	4	3	3	4	5	4	5
A	19	9	7	3	1	0	9	10	0	1	0	6	9	3	1	1	6	8	4	1	1	6	8	3	2	1
A	2	5	7	5	1	2	6	8	4	0	2	2	11	3	2	2	3	12	3	0	2	2	9	6	1	2
A	15	7	10	2	0	1	6	11	2	0	1	7	8	4	0	1	7	9	3	0	1	7	7	4	0	2
A	29	8	2	5	2	3	8	3	5	1	3	6	3	6	1	4	6	5	5	1	3	3	7	4	1	5
A	14	3	11	3	0	3	8	6	4	0	2	3	8	5	0	4	6	7	5	0	2	2	7	4	1	6
A	27	6	6	3	2	3	5	8	2	1	4	4	6	4	1	5	5	6	3	1	5	4	4	6	1	5
A	11	9	2	5	0	4	7	5	4	0	4	6	6	5	0	3	6	6	4	0	4	5	4	5	0	6
A	30	6	6	3	1	4	7	4	2	1	3	4	6	3	3	4	4	8	3	1	4	3	5	3	2	7
A	13	5	8	6	0	1	6	10	3	0	1	5	6	6	0	3	5	9	4	0	2	5	5	5	1	4
A	28	6	5	5	1	3	5	6	4	2	3	2	8	4	2	4	3	7	4	2	4	2	4	6	2	6
A	12	4	4	6	2	4	6	2	6	2	4	5	3	6	2	4	5	4	4	2	5	5	3	4	2	6
E	16	8	7	3	2	0	8	4	5	3	0	5	6	6	3	0	6	6	4	4	0	4	8	2	4	2
E	22	5	7	4	3	1	4	6	5	3	2	4	7	4	3	2	4	5	7	3	1	5	4	6	2	3
E	23	13	4	2	1	0	10	5	3	0	2	9	7	3	1	0	8	8	3	0	1	8	7	3	0	2
E	9	8	7	5	0	0	11	5	3	1	0	9	7	3	1	0	7	8	4	1	0	10	4	5	1	0
E	24	5	8	3	4	0	5	6	3	4	2	4	8	3	4	1	5	7	3	4	1	4	8	3	3	2
E	17	7	7	2	3	1	11	6	1	1	1	6	8	2	3	1	6	10	2	1	1	6	7	3	3	1
E	25	11	7	2	0	0	9	9	1	0	1	8	10	2	0	0	11	7	2	0	0	6	9	4	0	0
E	8	7	4	5	1	3	8	3	5	1	3	7	3	5	1	4	8	5	4	1	2	7	3	4	1	5
E	7	13	2	5	0	0	11	5	4	0	0	7	5	7	1	0	9	8	3	0	0	7	8	5	0	0
E	21	10	6	3	0	1	13	4	3	0	0	9	6	3	0	2	10	5	2	0	1	8	7	3	0	2
E	6	10	6	3	0	1	10	6	4	0	0	6	10	4	0	0	6	10	4	0	0	9	5	5	0	1
E	1	6	10	2	2	0	7	11	0	2	0	6	13	4	3	0	4	12	1	3	0	4	9	5	1	1
E	5	3	6	9	2	0	4	5	9	2	0	2	5	11	2	0	3	4	10	2	1	2	6	7	3	2
E	20	10	5	3	2	0	8	6	4	2	0	7	6	5	2	0	10	3	5	2	0	9	2	7	1	1
E	18	14	5	1	0	0	12	7	1	0	0	8	9	3	0	0	9	9	2	0	0	10	7	3	0	0
E	10	5	9	2	3	1	5	7	4	3	1	4	7	4	3	2	6	5	4	3	2	1	7	6	4	2
E	4	7	7	2	4	0	6	10	0	3	1	4	9	3	4	0	5	11	0	3	1	2	10	4	3	1
E	3	7	13	0	0	0	11	7	2	0	0	8	9	3	0	0	5	13	2	0	0	7	8	5	0	0

5. Cultural implications
6. Writing extension objectives
7. Motivation skills
8. Training and visit system
9. Village agricultural committees
10. Interrelationships in agriculture
11. Farm machinery
12. Forestry
13. Plant protection
14. Animal science
15. Horticulture
16. Programme development cycle
17. Your agricultural career
18. Communications skills
19. Farming systems research
20. Needs assessment
21. Demonstrations and field trips
22. Lay leadership
23. Effective pitsos
24. Logistics in extension
25. Programme evaluation
26. Marketing
27. Agronomy
28. Soils and conservation
29. Range science
30. Animal diseases

b. Key to responses

- to a great extent (3)
- to a fair extent (2)
- to a slight extent (1)
- don't know/don't recall (X)
- not at all (0)

c. KASA change

The KASA data configuration for all responses to all subject matters in raw scores is seen in Table 5.5. The same data in percentages with ordered subject matter are seen in Table 5.6. Finally, the data in percentages with agricultural topics and extension topics coded and segregated are seen in Table 5.7.

There was considerable variability in KASA change responses to agricultural subject matter, with reports of "fair" levels of change being frequent. The highest percentage of "3" scores were recorded for farm machinery, farming systems research, range science and marketing. The bulk of the "2" scores were related to animal science, horticulture, agronomy, plant protection and animal diseases. Consistent "1" scores were registered for agronomy, farm machinery, forestry, plant protection, soils and conservation and range science. There was slight "X" (no recall) scoring in all subject matters. The highest levels of negligible KASA change in agricultural subject matters were seen in farm machinery, forestry, soils, range and animal diseases. Those levels, however, were low in comparison to positive change reported in the same fields.

KASA change scores for extension subject matter were also variable with "fair" responses again being quite frequent. Topics such as motivation, communication skills, effective pitsos, demonstrations and field trips, and programme evaluation seemed to account consistently for high marks, while those such as philosophy of extension and agricultural careers scored many "2" or fair responses. Variability is such that a rather normal array of KASA change levels can be deduced. No recall seemed to be a modest but persistent problem with instruction in extension management and logistics in extension.

d. Practice change*

The data on practice change for the Airport Hotel course are likewise seen on Tables 5.5, 5.6 and 5.7.

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* It is to be remembered that practice change is also influenced by economic and environmental factors. Traditional African values are also important.

There was vast variablity in practice change in agriculture ensuing from the Airport Hotel extension education course. The highest level of "great" practice change was in horticulture. This was overshadowed by reports of "fair" practice change accruing to agronomy, animal science, horticulture, farming systems research, and range science. Significant "slight" levels of practice change were seen in agronomy, farm machinery, plant protection, marketing, and soils and conservation. The highest levels of no recall were found in marketing and range science, and rather high levels of negligible practice change were seen in animal diseases, soils and conservation, range science, and marketing.

With respect to practice change in extension topics there again was considerable variability in responses though "3" and "2" scores seemed to prevail in most subjects taught. Practice change to a great extent was the trend in such areas as writing extension objectives, training and visit system, village agricultural committees, communications skills, needs assessment, demonstrations and field trips, and effective pitsos. Practice change to a fair extent was seen subsequent to instruction in philosophy of extension, effective listening, extension management, motivation skills, interrelationships in agriculture, programme development cycle, agricultural careers, logistics in extension, and programme evaluation. Slight practice change was frequent for cultural implications, interrelationship in agriculture, needs assessment, and lay leadership. Modest no recall was seen for interrelationships in agriculture and programme development cycle, while no practice change was only significant in the training and visit system.

5.6.7 KASA and practice change for Research Division course

Keys for the interpretation of data in Table 5.8 and Figures 5.8 - 5.12 follow:

a. Key to subject matter

1. Agronomy
2. Potato production
3. Soil conservation
4. Weed control
5. Farm management
6. Extension methods
7. Horticulture
8. Farm machinery
9. Soil sampling
10. Fodder production

11. Marketing
12. Communications

b. Key to responses

- to a great extent	(3)
- to a fair extent	(2)
- to a slight extent	(1)
- don't know/don't recall	(X)
- not at all	(0)

c. KASA change

KASA changes reported by plant and soil science subject matter specialists subsequent to instruction in mainly agricultural subjects were positive with "3" scores predominating in such subjects as potato production, weed control, extension methods, horticulture, farm machinery, soil sampling techniques, marketing and communications. Fair KASA change "2" scores prevailed in agronomy and farm management. Slight change "1" scores dominated only in soil conservation, while the only significant no recall was in farm management. Very slight negligible KASA change was seen for fodder production. These data are seen on Table 5.8 and Figures 5.8 - 5.11.

d. Practice change

Practice change related to the same course was likewise quite positive. Between forty and sixty of the respondents reported a great extent of practice change in agronomy, potato production, weed control, extension methods, horticulture, and communications. Fair practice change was reported by fifty per cent in extension methods. Slight practice change was significant only in soil conservation, while the largest no recall score was in farm management (27%). Negligible practice change predominated for soil sampling techniques and was also significant in weed control and soil conservation. The configuration of these data is seen in Figure 5.12.

5.6.8 KASA and practice change for district-based course

The data contained in Table 5.9 and Figures 5.13 - 5.17 can be interpreted through use of the following keys.

a. Key for subject matter

1. Relation of research to extension
2. Needs assessment
3. Group formation and dynamics
4. Communications skills

TABLE 5.8: KASA AND PRACTICE CHANGE RAW SCORES FOR PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	7	8	2	0	1	11	6	0	0	1	5	6	4	0	3	9	6	2	0	1	10	3	3	0	2
2	11	4	3	0	0	13	4	1	0	0	9	6	2	1	0	12	6	0	0	0	11	3	3	0	1
3	4	4	6	3	1	7	4	4	3	0	3	5	5	3	2	6	5	5	2	0	3	5	4	2	4
4	12	3	2	1	0	17	1	0	0	0	10	6	1	1	0	13	3	1	1	0	8	3	1	1	5
5	4	6	2	5	1	5	5	2	5	1	3	7	2	5	1	5	7	1	4	1	4	4	3	5	2
6	11	7	0	0	0	11	6	0	0	1	11	7	0	0	0	10	6	1	0	1	8	9	1	0	0
7	14	3	1	0	0	13	4	0	0	1	13	2	2	1	0	13	5	0	0	0	10	5	2	0	1
8	9	3	5	1	0	8	6	3	1	0	8	3	5	1	1	9	4	3	1	1	8	3	4	1	2
9	10	5	2	1	0	11	5	1	1	0	7	5	4	1	1	11	4	2	1	0	5	3	0	1	9
10	5	3	5	3	2	7	6	1	3	1	5	6	1	3	3	6	5	3	3	1	6	4	2	3	3
11	7	4	4	3	0	8	3	4	3	0	6	5	4	3	0	5	5	5	3	0	4	5	3	3	3
12	13	5	0	0	0	13	5	0	0	0	11	4	3	0	0	11	4	2	0	1	10	5	3	0	0

KASA AND PRACTICE CHANGE IN PERCENTAGES FOR PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	39	44	11	0	6	61	33	0	0	6	28	33	22	0	17	50	33	11	0	6	56	17	17	0	11
2	61	22	17	0	0	72	22	6	0	0	50	33	11	6	0	67	33	0	0	0	61	17	17	0	6
3	22	22	33	17	6	39	22	22	17	0	17	28	28	17	11	33	28	28	11	0	17	28	22	11	22
4	67	17	11	6	0	94	6	0	0	0	56	33	6	6	0	72	17	6	6	0	44	17	6	6	28
5	22	33	11	28	6	28	28	11	28	6	17	39	11	28	6	28	39	6	22	6	22	22	17	28	11
6	61	39	0	0	0	61	33	0	0	6	61	39	0	0	0	56	33	6	0	6	44	50	6	0	0
7	78	17	6	0	0	72	22	0	0	6	72	11	11	6	0	72	28	0	0	0	56	28	11	0	6
8	50	17	28	6	0	44	33	17	6	0	44	17	28	6	6	50	22	17	6	6	44	17	22	6	11
9	56	28	11	6	0	61	28	6	6	0	39	28	22	6	6	61	22	11	6	0	28	17	0	6	50
10	28	17	28	17	11	39	33	6	17	6	28	33	6	17	17	33	28	17	17	6	33	22	11	17	17
11	39	22	22	17	0	44	17	22	17	0	33	28	22	17	0	28	28	28	17	0	22	28	17	17	17
12	72	28	0	0	0	72	28	0	0	0	61	22	17	0	0	61	22	11	0	6	56	28	17	0	0

FIGURE 5.8: KNOWLEDGE CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985

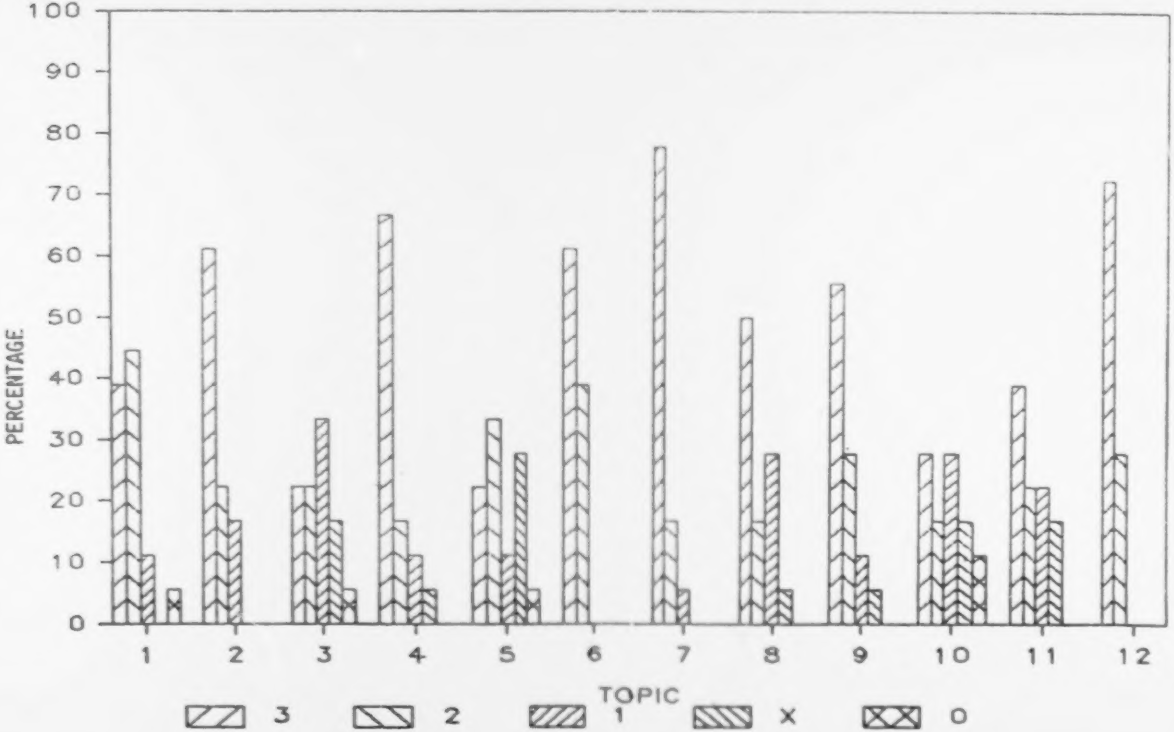


FIGURE 5.9: ATTITUDE CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985

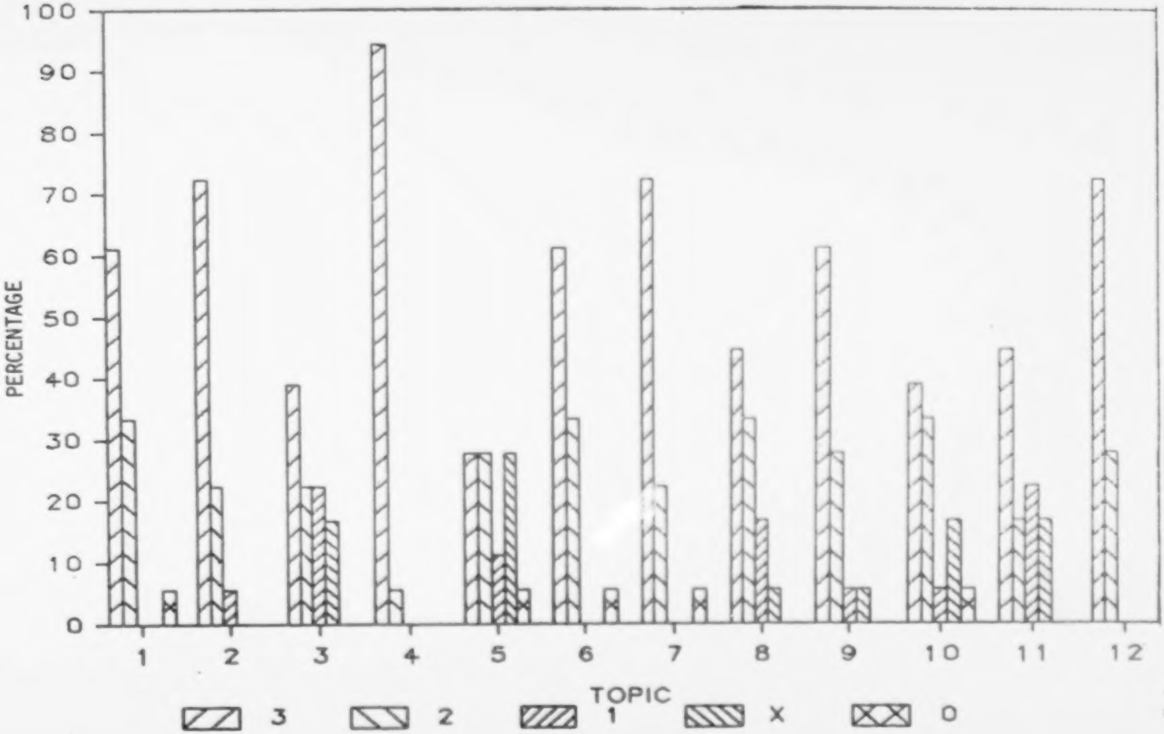


FIGURE 5.10: SKILLS CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985

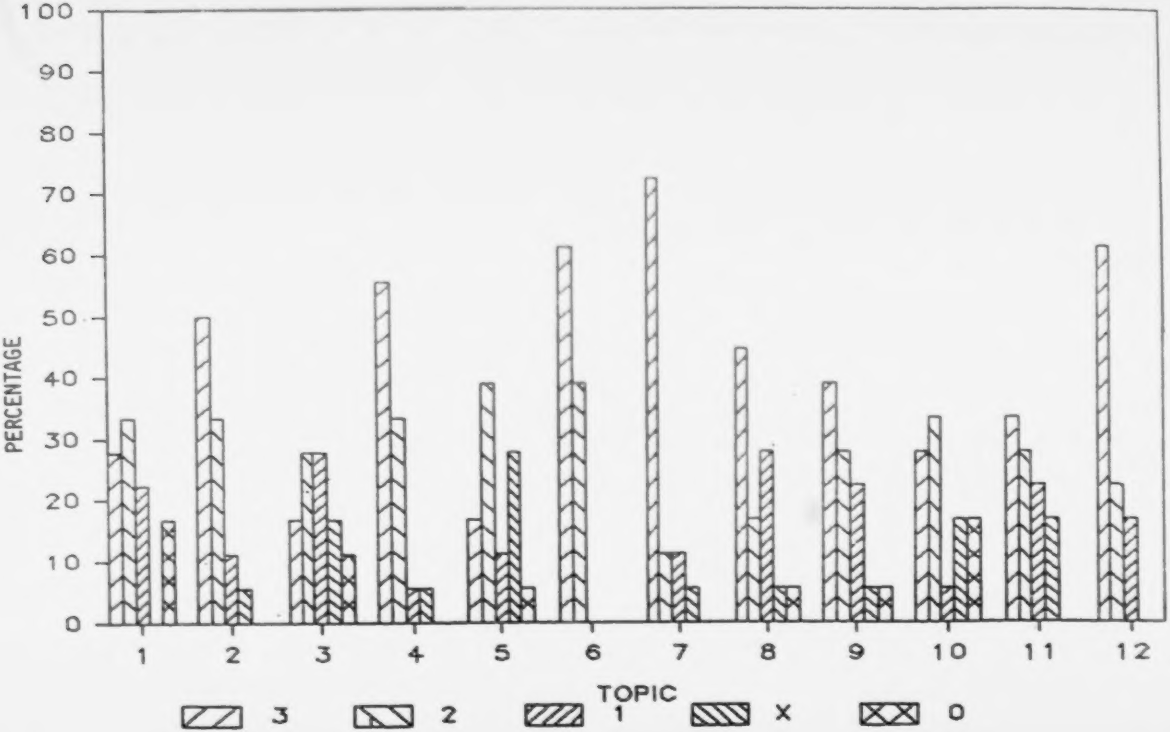


FIGURE 5.11: ASPIRATIONS CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985

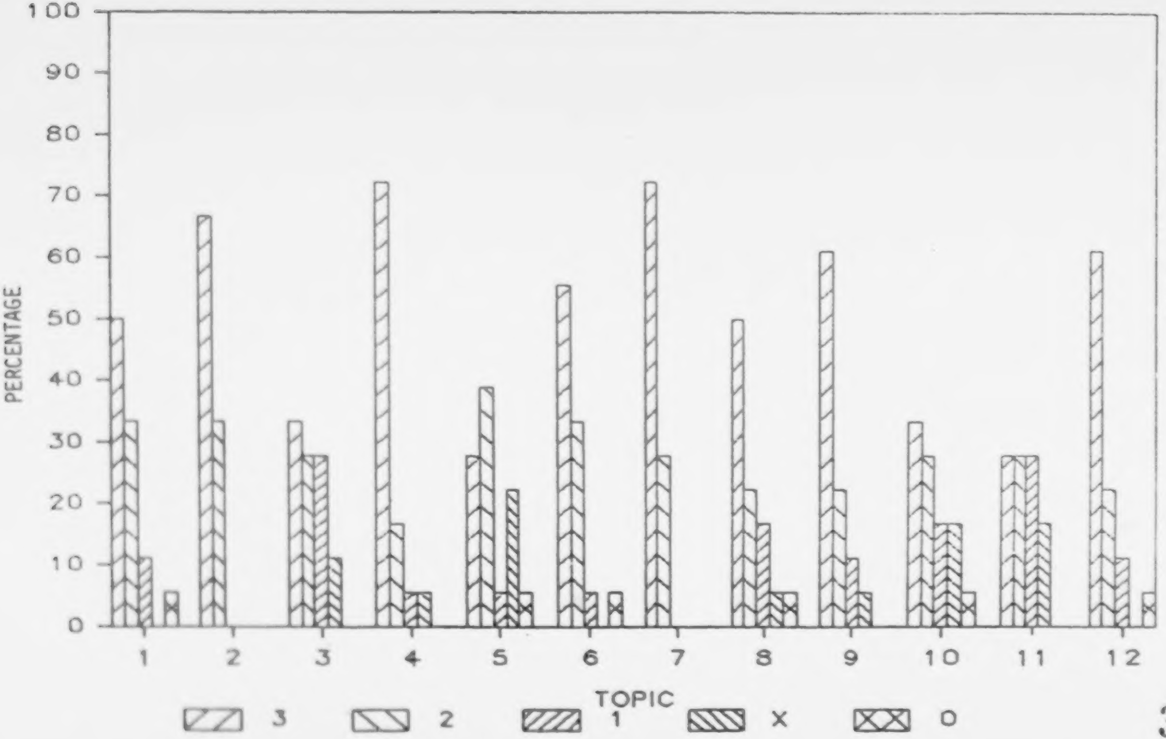
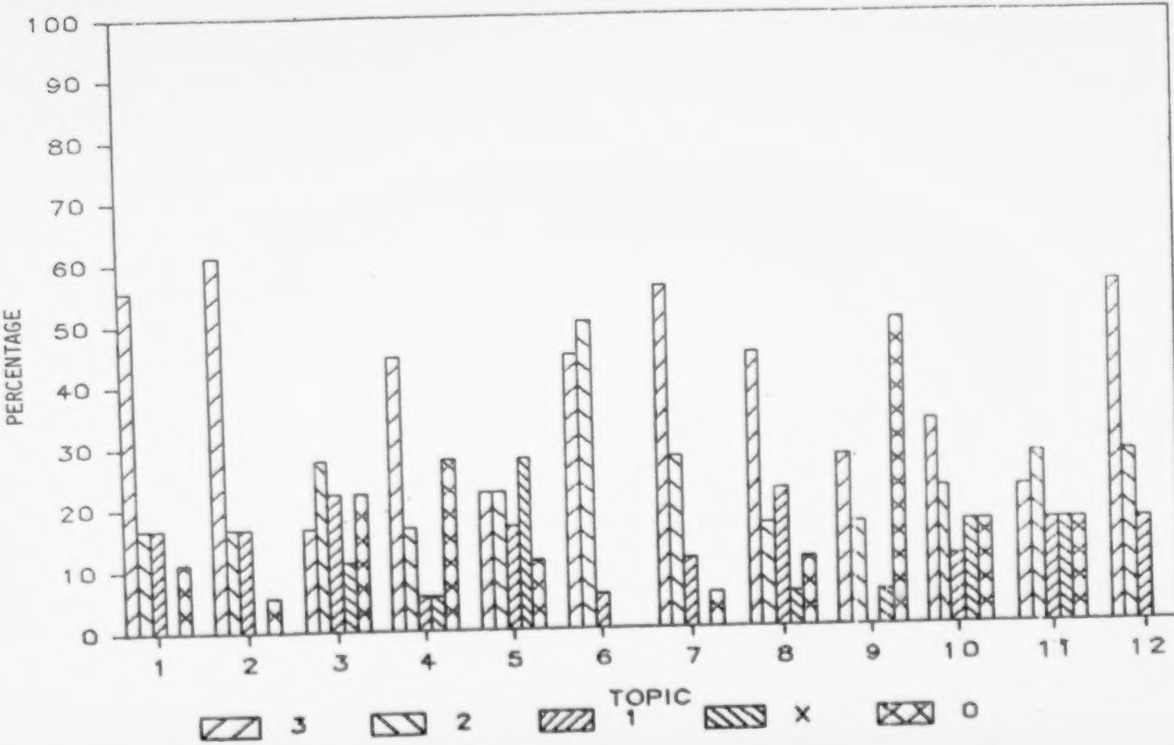


FIGURE 5.12: PRACTICE CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985



5. Extension teaching methods
6. Visual aids

b. Key to responses

- to a great extent	(3)
- to a fair extent	(2)
- to a slight extent	(1)
- don't know/don't recall	(X)
- not at all	(0)

c. KASA change

KASA change reported by these district-based extension workers and subject matter specialists in relation to the instruction in extension methods given in all ten districts of Lesotho was notable. The data can be seen in Table 5.9 and Figures 5.13 - 5.16. Scores of "3" indicating KASA change to a great extent dominated in all components of KASA and for all subject matters. KASA change to a fair extent was also significant for all subject matters. Slight KASA change was also seen in relation of research to extension and visual aids in the skills and aspirations components, while no recall was significant only for needs assessment. Negligible KASA change was insignificant.

TABLE 5.9: KASA AND PRACTICE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE IN RAW SCORES, LESOTHO, 1985

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	18	18	6	5	0	22	16	4	5	0	17	15	10	5	0	17	11	12	6	1	7	18	9	4	9
2	18	15	7	7	0	21	15	3	7	1	18	18	3	7	1	21	12	6	7	1	10	19	11	3	4
3	22	15	6	4	0	27	13	2	5	0	18	17	5	5	2	21	19	1	5	1	11	22	7	3	4
4	30	12	3	1	1	30	10	6	1	0	23	18	5	1	0	23	16	7	1	0	20	14	9	0	4
5	26	7	9	5	0	27	7	7	3	3	16	15	10	3	3	22	8	10	3	4	10	13	8	1	15
6	27	17	1	2	0	28	16	1	2	0	23	15	7	2	0	21	14	10	2	0	18	13	12	1	3

KASA AND PRACTICE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE IN PERCENTAGES, LESOTHO, 1985

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	38	38	13	11	0	47	34	9	11	0	36	32	21	11	0	36	23	26	13	2	15	38	19	9	19
2	38	32	15	15	0	45	32	6	15	2	38	38	6	15	2	45	26	13	15	2	21	40	23	6	9
3	47	32	13	9	0	57	28	4	11	0	38	36	11	11	4	45	40	2	11	2	23	47	15	6	9
4	64	26	6	2	2	64	21	13	2	0	49	38	11	2	0	49	34	15	2	0	43	30	19	0	9
5	55	15	19	11	0	57	15	15	6	6	34	32	21	6	6	47	17	21	6	9	21	28	17	2	32
6	57	36	2	4	0	60	34	2	4	0	49	32	15	4	0	45	30	21	4	0	38	28	26	2	6

FIGURE 5.13: KNOWLEDGE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985

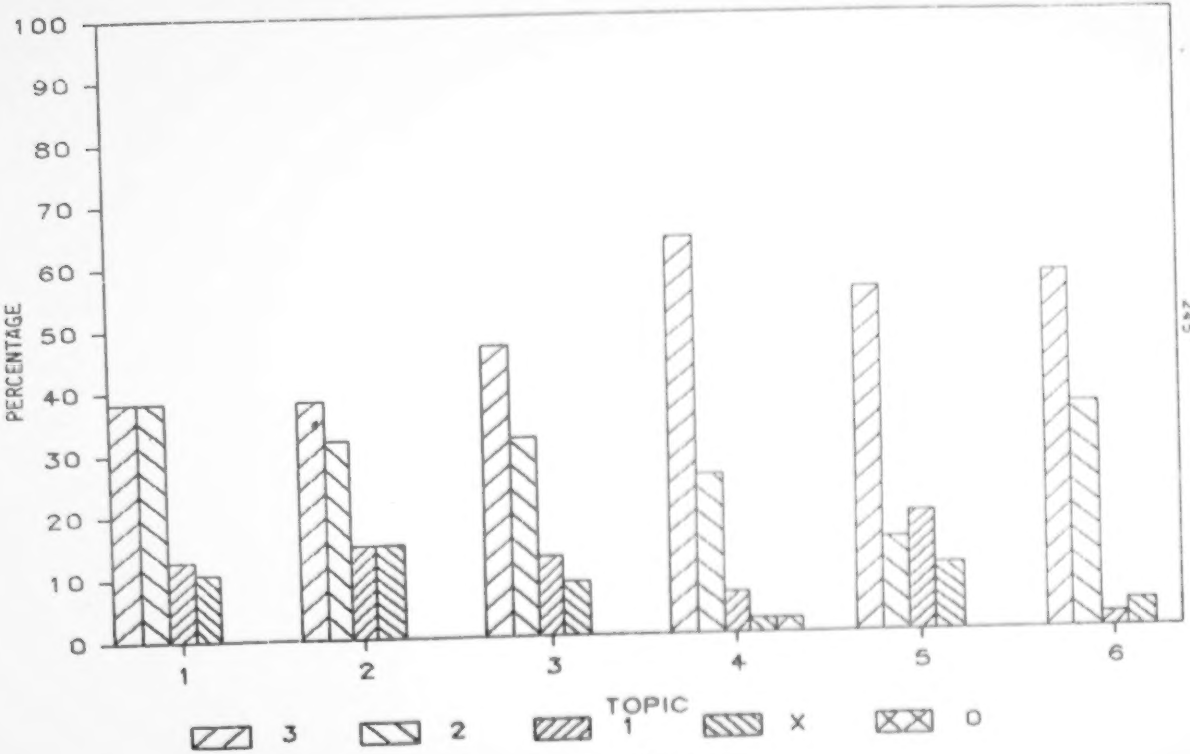


FIGURE 5.14: ATTITUDE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985

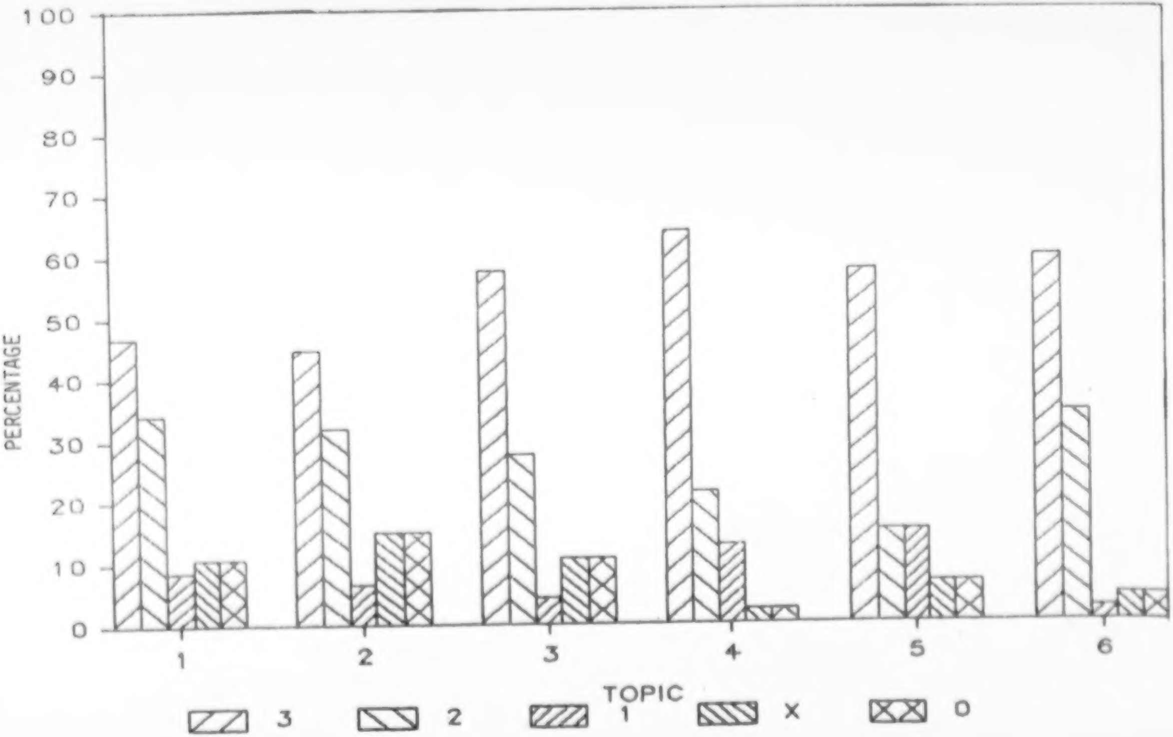


FIGURE 5.15: SKILLS CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985

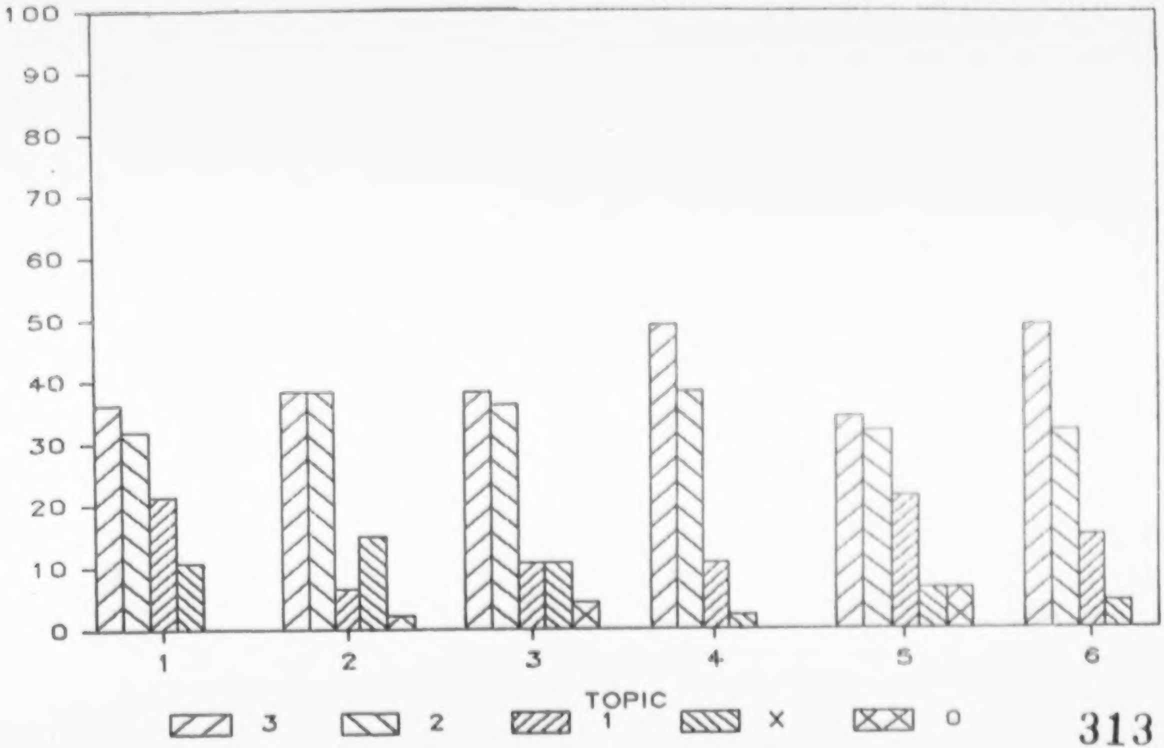
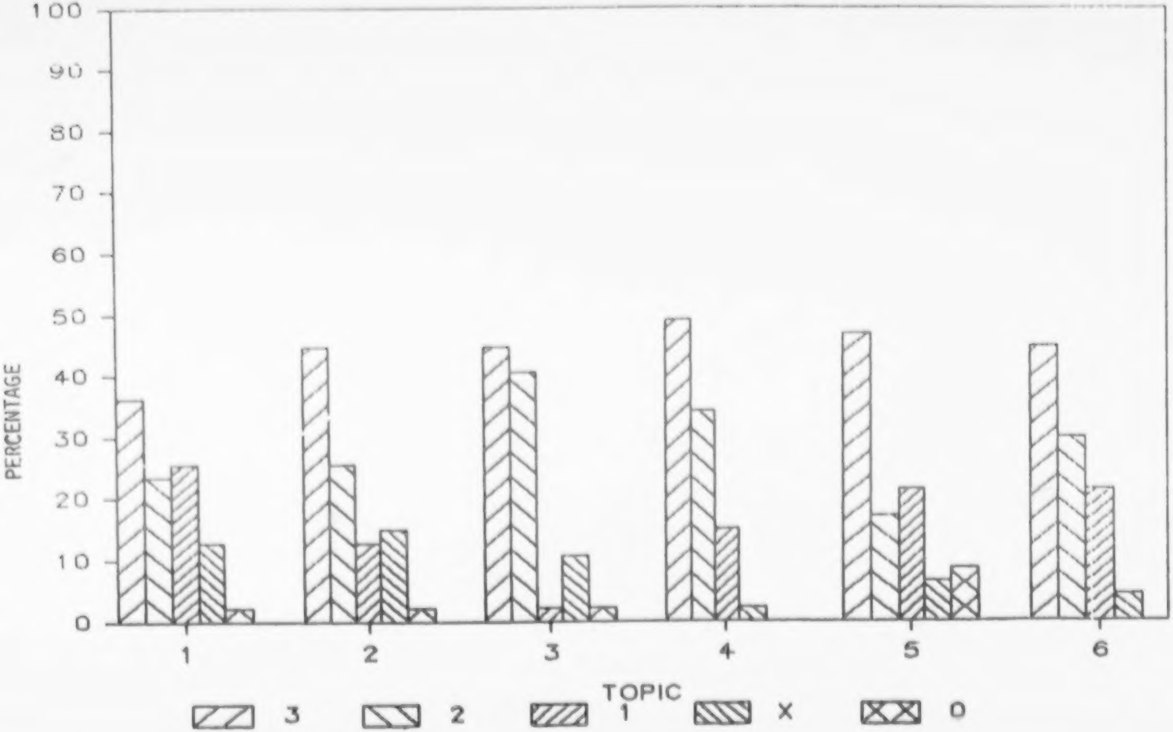
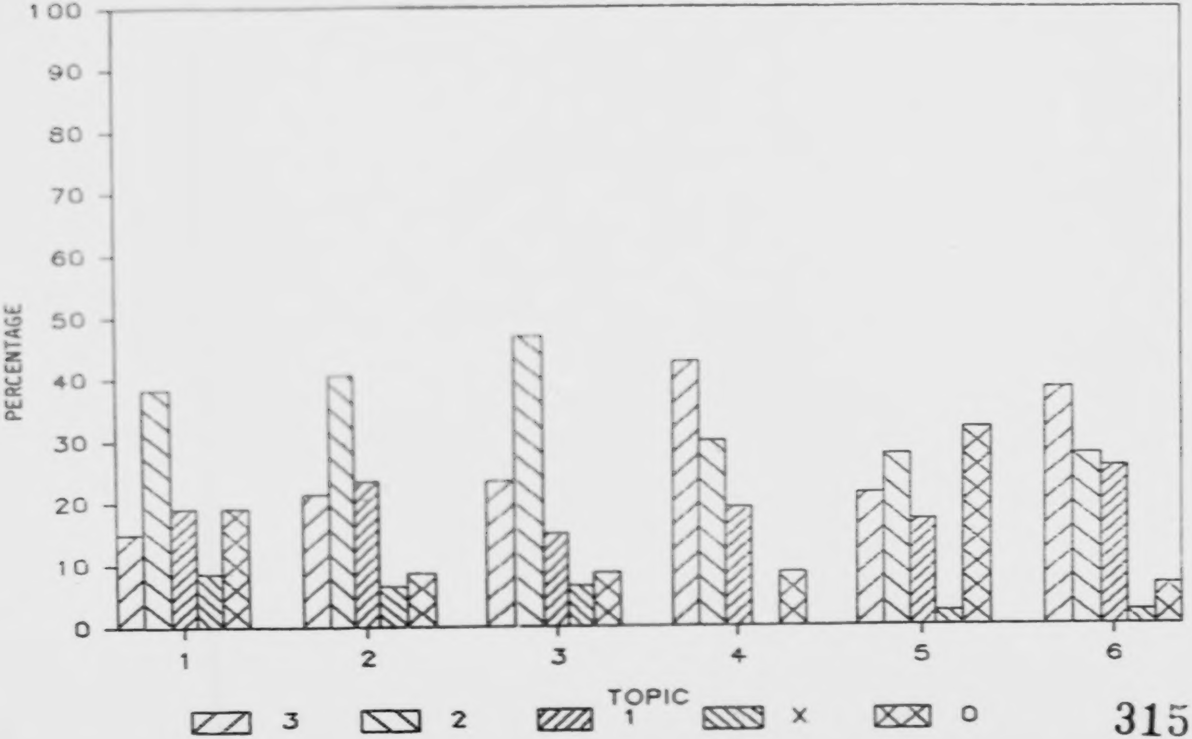


FIGURE 5.16: ASPIRATION CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985



245e

FIGURE 5.17: PRACTICE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985



d. Practice change

Practice change reported by this group differed slightly from KASA scores in that fair change tended to predominate in needs assessment relation of research to extension, group formation and dynamics, and extension teaching methods. Practice change to a great extent prevailed in communications skills and visual aids, while slight change was significant in needs assessment and visual aids. Negligible practice change was insignificant while a significant no recall reponse was seen for extension teaching methods.

5.6.9 Examples of practice change

In order to ascertain the nature of reported practice change related to the extension education courses conducted for district-based extension workers and subject matter specialists, open-end probe questions were asked respondents permitting them the opportunity to expand on their responses. Examples of practice change thus described follow*.

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* Many of these represent important breakthroughs and advances in extension methodology in Lesotho, which were not happening prior to FSR/E.

Respondent DB-4 formed a farmers' association of 35 members in order to purchase inputs on credit and contract for tractors, to which over half contributed financial quotas. Respondent DB-5 surveyed sites and gathered farmer opinion on location of irrigation sites, organized crop production associations, and conducted monthly training for district staff employing improved extension methods. Respondent DB-7 made his own visual aids. Respondent DB-8 organized ox-drawn implement groups, involving 90 farmers, for ploughing and planting operations. Respondent DB-15 began to make farm and home visits to her women's groups after attending the course. Respondent DB-17 used posters to demonstrate proper weeding. Respondent DB-26 said his improved communication skills and extension techniques were used in his work with TOU farmers. Respondent DB-29 sent soil samples to the research laboratory, and practised group techniques among his farmers. Respondent DB-30 used the village agricultural committee method with good results. Respondent DB-33 used charts and posters in nutrition education and measuring tapes for determination of field size. Respondent DB-34 taught animal nutrition to his farmers. Respondent DB-37 organized a Merino association of 17 farmers who had purchased 350 improved ewes and 10 rams, and a Brown Swiss association of 35 farmers who intend to work toward improved animal quality. Respondent DB-38 used visual aids in demonstrating functional poultry houses to farmers who are now building their own. Respondent DB-40 taught farmers about the advantages of using cow manure and also demonstrated inter-row cropping using beans and peas with maize.

Respondent DB-41 read research circulars which were helpful to his work. Respondent DB-44 said she had formed a village agricultural committee, and was using posters in her extension programmes. Respondent DB-46 conducted planting demonstrations on cabbage for members of young farmers' clubs, took them on farm walks, and used visual aids to show breed characterics of swine and dairy cows. Finally, Respondent DB-47 developed charts and posters about food groups and breast-feeding. Respondent RD-2 used cultivars applicable to his region and conducted some market research. Respondent RD-3 did some physical and chemical weed control. Respondent RD-4 made use of the farm machinery mobile unit in her area. Respondent RD-5 planted grass for donga control. Respondent RD-6 implemented an apple tree programme with 95 farmers. Respondent RD-7 conducted short courses on the calibration of ox-drawn machinery. Respondent RD-11 taught farmers how to mulch and encouraged them to plant trees. Respondent RD-13 devised farm management instruction for an illiterate farmer group. Respondent RD-14 encouraged farmers to grow fodder on marginal lands. Respondent RD-15 ordered FAO-funded weeding machinery for farmers.

Respondent M-2 organized pitsos for instruction in sorghum production. Respondent M-7 mounted agricultural campaigns using farmers as deliverers of the campaign messages; he also planted pine and poplar trees. Respondent M-8 tried to improve maize production through on-farm trials. Respondent M-9 taught farmers about hybrid seed. Respondent M-10 planted a woodlot with villagers over a two-week period. Respondent M-11 facilitated market contracts for farmers among both villagers and traders. Respondent M-12 conducted wheat variety trials with four different farmers on the high veld. Respondent M-19 implemented a rotational grazing programme in his area.

Respondent AH-2 was able to recognize animal diseases and relate them to appropriate treatments. Respondent AH-3 conducted programme evaluations. Respondent AH-4 staked tomatoes with maize. Respondent AH-6 promoted supplementary feeding of livestock. Respondent AH-7 formed wool and mohair growers' groups. Respondent AH-14 adopted methods taught about organizing effective pitsos with good results. Respondent AH-15 organized in-service training for subordinates around discussion groups. Respondent AH-17 did research in afforestation in the mountain area. Respondent AH-18 helped extension assistants use short format to plan annual work programmes. Respondent AH-19 motivated farmers to improve indigenous cattle.

This review of examples of practice change reflects the substantial array of subject matter contained in the extension education programmes conducted for this clientele, indicates its practical nature and demonstrates the manner in which innovations learned are put into practice by agricultural professionals in the field.

Of course, there are inhibiting factors to practice change in every environment. Many were voiced by the participants which were not unlike those found by Bembridge, Steyn and Williams (1983, pp. 84 - 88) in KwaZulu. Things such as lack of transport and lack of materials for visual aids appeared frequently. Insensitivity of superiors and non-availability of inputs were registered infrequently. No place for planting trees, lack of farmer cooperation and inadequate marketing infrastructure were also mentioned. However, since there is ample evidence above that many field workers have surmounted these inhibitors and have mounted successful programmes implementing positive practice change, it may be suggested that the concerns identified represent inconveniences and complaints and that they are not real constraints to effective extension education programmes.

5.6.10 Recommendations by participants

In order to elicit maximum feedback from field-based personnel toward making future instruction more effective, all respondents were asked what suggestions they had for the improvement of the Research Division's continuing education programmes.

There were many recommendations stated by individual respondents which, while interesting, represented personal concerns. Others were voiced by small groups with special concerns. However, those representing relatively wide sentiment were nine.

That the extension continuing education courses be held with greater frequency was recommended by 38 persons (36%). That more practicals become part of the instruction was felt by 29 individuals (27%). Some 24 respondents (23%) called for more follow-up by research personnel after courses. A group of 19 participants (18%) said courses should be longer, most calling for two-week courses as opposed to those given for a single week. Field trips were deemed necessary by 14 respondents (13%). Lecturers must be more knowledgeable and more audio-visual aids should be used in the instruction according to 11 people (10%) for each of those recommendations. Finally, 10 persons (9%) each called for more time per topic and nutrition education as a subject matter to be included.

5.7 SUMMARY

The impacts of farming systems research extension continuing education programmes perceived by field-based extension workers and subject matter specialists were both positive and significant. It seems to have been a valuable decision to take those programmes, earlier restricted to a selected few, to the districts in order to reach more field people and to get closer to field problems.

Instruction in extension education methods seemed to strengthen the professional versatility of persons earlier trained in technical subject matter, while instruction in agriculture enhanced the knowledge and skills of general extension workers. In both cases, the "up-date" nature of the programmes was most appropriate.

KASA change related to the programmes, while indicative, was seen as positive. Though there was considerable variability in responses, change to a great or fair extent was most frequently reported. Change to a slight extent was also seen. No recall and no learning was isolated to infrequent instances of but a very few subject matters.

Practice change responses were likewise variable but positive. Many responses reported fair practice change in a number of subject matters with frequent accounts of change to a great extent in areas of specialization or particular appropriateness. Again, no practice change and no recall were less frequent and seemed to be related to subject matters not relevant to the respondent's principal assignment or simply of little interest to him/her.

Examples of practice change were encouraging in that they represented living testimony, as it were, to the feasibility of sound extension education events under conditions of limited resources. Under those circumstances, associated reports of inhibiting factors seemed to articulate complaints rather than constraints. Important recommendations were compiled by participants which tended to support and improve the current trend of extension continuing education programmes.

CHAPTER 6 CONCLUSIONS

Extension education programmes in Lesotho, carried out from 1979 through 1984 in conjunction with a farming systems research development strategy, had tentative but indicative impacts on three key targets groups in that country's agriculture. These were farmer contact groups, chiefs, headmen and headwomen, and district-based extension workers and subject matter specialists.

The research which produced this conclusion separately addressed and provisionally fulfilled the several components of the purpose of this study. The role of nonformal education in meeting the needs of the rural poor was investigated through the works and pronouncements of major scholars in the development education community and was seen to be both central and critical to new and dynamic interdisciplinary approaches to integrated development.

Extension education was studied as that form of nonformal education developed within and specifically for the agricultural evironment. Scholarship into the findings of principal extension administrators and practitioners documented the vital and dynamic role of extension education in the agriculture of the developing world.

A contemporary school of thought has produced a contemporary body of literature about farming systems research as an integrative strategy designed to make the farmer a proactive partner in agricultural development. Exhaustive research into the works of principal proponents of the farming systems research strategy established that there is no stage in which extension education is not ideally involved if desired change is to take place and endure. The active role extension education has played in the Lesotho farming systems research intervention confirms that relationship.

The impact of extension education programmes on members of farmer contact groups in the farming systems research prototype areas in Lesotho became clearer in self perceived changes among members in their knowledge, attitudes, skills and aspirations levels in the subject matter areas taught. Further, indication of positive impact was seen in reported practice change in such areas as agronomy, horticulture, pest control, farm machinery and rural leadership. This trend was shown to be even more promising in terms of the real benefits of farming systems research through extension education as perceived by the same clientele. Prominent among those benefits were such developments as better meals for farm families, higher yields, more income from farming and the ability to acquire better farm inputs.

The effectiveness of farmer contact groups as an innovations diffusion network and as disseminators of agricultural information was discovered to be quite positive, the data demonstrating an approximate nine-fold multiplier effect for three diffusion modes studied.

Basotho chiefs and village headmen and headwomen likewise perceived generally enhanced KASA change levels in several subject matters taught in extension short courses as well as a similar reflective profile for changes in their practices as village leaders. However, for other subject matters this clientele reported high rates of non-learning and/or no recall resulting in negligible practice change. The data at hand do not suggest the underlying causes of this phenomenon. At the same time, these same traditional leaders benefited significantly from the extension education programmes in question and were unanimous in their support for farming systems research as a development strategy.

District-based extension workers and subject matter specialists in Lesotho also reported a widespread positive impact of farming systems research extension education programmes in the many subject matters taught. As might be expected among a more educated and discriminating group, there was higher variability in perceived levels of attainment in the subject matters in question. The group was likewise variable in the practice change that ensued in professional life which could be related to the extension education programmes under study. However, examples described represented real breakthroughs in the demonstrated expertise of those involved.

Other findings were discovered or formulated during the study which are relevant to the development and improvement of future farming systems research and extension education programmes.

Farming systems research is a useful strategy in that it is interdisciplinary, and it engages the farmer directly in the dynamics. It is, however, not a panacea for low agricultural productivity nor should it be considered as a "blueprint for Africa". The paradigm, as developed by the principal proponents (mainly agricultural economists) seems to have assumed too much with regard to the homogeneity of small farmers, their access to resources, their likemindedness, and their propensity toward adoption of "packages" or integrated farming schemes. The Lesotho experience indicates quite something else. Farmers are heterogenous with respect to access to resources and propensity toward change. They do adopt innovations but they do not voluntarily adopt packages. They pick and choose bits and pieces of a wide array of recommendations prompted by such factors as affordability, family priority, resources, cultural or traditional values, risks involved and personal inclination. There seems to be little behavioural uniformity among the farm clientele. Adoption takes place through selective individual decision making. Yet, cumulative or collective practice change or adoption of innovations may still be significant over time.

Extension education is a necessary component in the agricultural development formula. Much literature evolving from the frustrations of failed development efforts lays blame for the infrequency of success at the doorstep of ineffective extension systems. However, pretending that extension education is not necessary is to "pretend away" a vital link in the agricultural innovation continuum. Rather, extension education must be flexible, modifiable and adaptable to local resource levels in order to be successful. The Lesotho experience is a testimony to this.

Extension education is an art. As other arts respond to and are influenced by, their times and environments, so too is extension education. Successful extension education depends on a subtle and delicate relationship between educator and student in which both learn from each other. The relationship is never static. Voiced constraints to extension successes frequently dwell on insufficiencies in materials, support and rewards for extension educators. As there is no environment so severe as to stifle art, there is likewise no environment so impoverished as to prevent useful learning. Extension education can happen anywhere if it is scaled to the resource availability of both extension workers and farmers.

The Lesotho study suggests the existence of an "extension effect", a dynamic in which gains in the enhancement of knowledge, attitudes, skills, aspirations, practice change and real benefits related to any agricultural innovation rise in direct proportion to the intensity and frequency of extension education programmes.

The position, so frequent in the literature, that extension education programmes in the developing world are designed for and directed at men is not corroborated by the Lesotho farming systems research and extension education experience. To the contrary, women farmers constituted nearly 75% of the farmer contact group membership and were responsible for most of the documented innovation. Women held 45% of the chiefs and headwomen positions and were among the more proactive in post-educational rural leadership. Women accounted for 25% of the district-based corps of agricultural professionals who participated in extension continuing education programmes, not only in domestic economics roles but also in agricultural responsibilities. The extension education programmes assessed in this study were not only designed to recognise a strong female presence, but also reaped the rewards represented by that dynamic human resource.

It is significant that, in this study, Claude Bennet's (1982) reflective appraisal of programmes (RAP) evaluative methodology was tested in a developing world setting, specifically a rural African setting. The methodology was adapted as necessary for the Lesotho milieu.It was felt that the response scores were uniformly quite high, higher than would have been seen in the American or European setting. They were highest among farmers, lending toward greater variability among chiefs and even more so among professional agriculturalists. This could be interpreted by some as bias or unsubstantiated optimism.It is interpreted in this research as something else. The opportunities for direct participation in extension education programmes for farmers in rural Lesotho are infrequent while other factors of the daily environment are grossly routine. Thus, when a team of extension educators arrive in the area to conduct a course, the event as well as the content represents a unique departure from the routine. Thus, the things that are learned, be they knowledge or skills, are magnified in the mind's eye and become reflected in subsequent perceptions. It is such that those same perceptions are reported with more enthusiasm and optimism than is the case among chiefs and more so among extension workers who are exposed to greater numbers of change agents and who have a wider range of educational opportunities. So, it seems that the RAP methodology can be influenced by the environment in which it is used. That does not, however, alter the idea that perceptions are being reported personally as the participant sees them and feels them. The more educated and more exposed is the clientele, the more moderate and variable will be the responses. But, if learning is perception, then the RAP methodology retains its legitimacy in the field of extension programme evaluation.

A final conclusion is that more research into extension education in the developing world is desperately needed. The literature is rife with agricultural research finds, economic concepts, and unsubstantiated and uncorroborated pronouncements about the worth of extension education in the development formula. There are reports of extension education successes and there are reports of extension education failures. Unfortunately, not enough is known about either.

As the world approaches the millennium, humankind's supremacy as steward of the resource base will come under very severe pressure. Surely, its survival will depend in large part on its enlightenment, as well as its ability to cope. It is certainly reasonable to suggest that the evolving field of extension education can contribute importantly to both.

APPENDIX

EXAMPLE OF RAP INTERVIEW QUESTIONNAIRE:

INTERVIEW QUESTIONNAIRE (FCG)

Reflective Appraisal of Nonformal (Extension) Education Programmes Among Members of Farmer Contact Groups in Three Prototype Areas in Lesotho, 1981 - 1984.

1. Description of Programme

(Read this information to inverviewee). Since 1981, the Research Division of the Ministry of Agriculture, through its Farming Systems Research Project, has brought educational programmes to you, the members of Village Agricultural Committees and Farmers Cooperatives, first at Farmers Training Centres and then at the Field Research Centers in the prototype areas. There have also been farmers field days in each area and radio programmes on farming matters broadcast each Saturday morning.

You have been chosen for interview because you were a participant in one or more of these educational activities. In this way you may share your responses with the division and assist directly in evaluating past experiences and improving future ones.

2. Biographical Data

(Read to interviewee, ask questions, and record the data) So that your needs and those of other farmers like you can best be served, the division would be pleased to know more about you. Please be so kind to share such information with your interviewer. The facts you share will not be linked to your name in any way, but will simply assist the division to better know the characteristics of the people it serves.

Age: ________________ Sex: ____________ Single: _______________

Married: ______________________ Other: ___________________________

Number of children: ___________ Other _________ Ages: ____________

Village or town: ____

Prototype area: ____

How long have you farmed? ________________

Did you attend school? ______ Highest form completed: ________

Have you worked in the RSA? __________

If so, in what kind of work? ____________________________________

____

Do members of your immediate family now work in the RSA ? _____

How many? _________ In what kind of work? ______________________

____

Of which VAC or Farmers Coop are you a member? _________________

Total length of VAC/FC membership: _______________ As a VAC or FC member, how many non-members have you told about new agricultural information or practices? _________________________

How many have you "showed how" to farm in better ways? ________

How many do you think have learned better farming methods by "observing" what you do on your farm? _____________ How, or from whom, do you learn most new farming information? ______________

____

3. Inputs and People Involvement

(Read relevant section only) You will recall that the Agricultural Research Division conducted a series of courses for members of its VAC's and Farmers Coops since 1981 as follows:

1981 VAC short course at Mokhotlong FTC ________
1982 VAC short course at Mokhotlong FTC ________
1983 VAC short course at Mokhotlong FTC ________
1984 Farmers Coop short course at Molumong FRC ________

1981 VAC short course at Matela FTC ________
1982 VAC short course at Matela FTC ________
1983 VAC short course at Nyakosoba FRC ________
1984 Farmers Coop short course at Nyakosoba FRC ________

1981 VAC short course at Mohale's Hoek FTC ________
1982 VAC short course at Mohale's Hoek FTC ________
1983 VAC short course at Siloe FRC ________
1984 VAC short course at Siloe FRC ________

You were one of more than 194 participants who attended one or more of these courses. Please check which courses you attended.
Total:__________

The content of the courses consisted in: (Read slowly and/or hand interviewee a description of content in Sesotho).

- Agronomy

- seedbed preparation, seeds, manures, commercial fertilizers, winter fallowing, weed control, seed storage, time of planting, recommended varieties, crop culture on main crops.

- Horticulture

- seedbed preparation for vegetables, early production of cabbage, potato production, direct sowing of vegetables seeds, compost heap/pit, pruning of fruit trees, planting of young trees, vegetable types and varieties, fertilizers and manures, time of planting.

- Plant Protection

- control of smut in wheat and maize, control of aphids in cabbage, stalk borer treatment, cutworm control, rodent control, common pests in the mountains, disease prevention and control.

- Farm Machinery

- calibration of ox-drawn planters, plow, and other equipment, yokes, harrows, demonstration of Areana equipment, modification of Safim equipment.

- Animal Management and the Range

- feeding of a dairy cow, grazing control regulations, rotational grazing, livestock and feeding of roughage (maize stover, wheat chaff, beans, peas, chaff, barley, cured oats), concentrates (grains, licks), starting a poultry flock, animal disease control (sheep scab, black quarter, blue tongue, pulpy kidney), animal management, breeding, culling nonproducers, proper stocking rates on the range, fodders, livestock importation policies.

Also in 1983-1984, farmers field days were held in Siloe (livestock), Nyakosoba (crops), and Molumong (crops). Altogether, 140 farmers attended these field days where more of the above subjects were seen and discussed. Did you attend one of these field days?____________

Radio programmes about these topics and others have been regularly broadcast for farmers over Radio Lesotho each Saturday morning. Do you own a working radio?______________ Do you listen to these programmes?____________ How often?_________ Do you learn well by radio?_________

4. Validation

(Read to interviewee and record response) According to your recollection of the course(s) you attended, the field day you may have attended, and the radio programmes you may have heard; is the above description of the Research Division's educational programmes (check one).

_____ accurate so far as you know?
_____ reasonably accurate?
_____ not accurate?
_____ don't know/don't recall.

5. Reaction

(Read to interviewee and record response) To what extent did these activities meet your expectations at the time? (check one)-

_____ to a great extent
_____ to a fair extent
_____ to a slight extent
_____ not at all
_____ don't know/don't recall

6. Methods

(Read to interviewee and record response) In the short courses and field days described, a number of extension teaching methods were used. Which one do you prefer? (check one) -

_____ Illustrated talk
_____ Demonstration
_____ Field trip/field day
_____ Combination of above

Which venue did you like better for the short courses? (check one) -

_____ Farmers Training Centers
_____ Field Research Centers
Why?____

7. Reflection

(Read to inverviewee and allow prescribed time for reflection) Please take 10 minutes to think back on the content of the educational activities in which you participated and on what it has meant to you in your farming activities. Your interviewer will assist you at your request.

8. Responses, KASA and Practice Change

(Read questions from RAP and record responses). This part of the interview will determine certain results of these educational programmes as you, a farmer, perceive them. Your interviewer will ask you some questions and record numbers which correspond to your answers.

Example: (for interviewer)

To what extent did you learn more about farm machinery?

_____ to a great extent (3)
_____ to a fair extent (2)
_____ to a slight extent (1)
_____ not at all (0)
_____ other (X)

Interviewer: Please use the following matrix to record numbers which corresponds to interviewee's responses.

	A	B	C	D	E
Content	Knowledge	Attitude	Skills	Aspirations	Practice Change
1.Agronomy					
2.Horticulture					
3.Plant Protection					
4.Farm Machinery					
5.Animal Mgt/Range					

Your responses have been most helpful.

9. Open-End Probe Questions

(Read to your interviewee and write out responses). Some of your responses are very interesting. Please be so kind to discuss or explain them further. Perhaps you could give some examples. (Interviewer; this is an example: "You indicate that you acquired a great deal of skill in calibrating ox-drawn machinery. Can you describe that skill?" Also, please have interviewee explain any item marked "Z" on the matrix.)

Response Comments

10. About Your Farm (Closed-end Probes)

(Interviewer, read aloud to interviewee and record responses) In trying to improve farmer education programmes and direct them toward the real needs of the farming community, it is important to know something about your farm. Please share the following information with your interviewer:

- How large is your farm ? ____________________
- What crops do you grow ? ____________________
- What kind of animals do you graze on the range ? ______ ____________________
- How many of each ? ____________________
- Do you have a herd boy ? ____________________
- Is he a member of your family ? ____________________
- Do you milk cows ? __________ How many ? __________
- Do you keep poultry ? __________ How many ? __________
- Do you keep pigs ? __________ How many ? __________
- How many members of your family work on your farm ?___
- Do you grow a home garden ? ____________________
- Do you share a communal garden ? ____________________
- What vegetables do you grow ? ____________________
- Do you weed your crops and vegetables ? ____________________
- How ? ____________________
- Do you control insects and plant diseases ? ____________________
- Do you hire outside labour ? ____________________
- Do you own machinery ? ____________________
- What kind ? ____________________
- On your farm, do you produce more than your family and animals consume ? ____________________
- Of what commodities ? ____________________
- How do you market them ? ____________________
- Where ? ____________________
- Do you keep farm records ? ____________________

11. End Results

(Read to interviewee and record responses) How have the changes you have made as a result of these educational programmes benefited you and your family? (Check as many as are appropriate).

- More income from farming ________
- More trading with neighbours ________
- Acquisition of more property ________
- What kind ?________________________________
- Acquisition of better animals ________
- Stored and/or preserved food ________
- Better meals for family ________
- Better education for children ________
- Higher crop yields ________
- Better condition of animals ________
- Able to purchase improved inputs ________
- Able to secure credit/loans ________
- Improved farm records ________
- Better markets ________
- Other ________
- No significant benefits ________

12. Constraints

(Read to interviewer and record comments) If there were changes you really wanted to make on your farm but were unable to do so, please explain why.

____

____

____

____

____

13. Recommendations

(Read to interviewee and write out comments) What suggestions do you have for the improvement of Research Division's farmer education programmes ?

a. ____

b. ____

c. ____

d. ____

Thank you for your participation in this interview. In this way you have directly assisted your ministry in continuing to meet your needs.

BIBLIOGRAPHY

AID, Lesotho farming systems research project paper (unclassified). Washington: USAID, 1978.

ANDERSON, C.A. Fostering and inhibiting factors. *In:* BREMBECK, C.S. *and* THOMPSON, T.J. *eds. New strategies for educational development.* Lexington: Heath, 1973.

BAKER, D. Institutionalisation of farming systems research and extension in Botswana: current programmes and advantages of improved research-extension linkages. *In:* BUTLER FLORA, C. *ed. Farming systems research, extension, implementation and monitoring, abstracts.* Manhattan: Kansas State University, 1984

BATH, W. *Position description: extension communications specialist.* Pullman: Washington State University, 1980.

BECKERMAN, S.R. *End of tour report/communications/information specialist.* Maseru: FSR, 1981.

BEMBRIDGE, T.J. *Agricultural extension: the key to rural development in the present and former homelands.* Alice: Fort Hare University Press, 1978.

BEMBRIDGE, T.J. *A systems approach to agricultural development in the national states of South Africa.* Dublin: University College, 1982.

BEMBRIDGE, T.J., STEYN, G.L. *and* WILLIAMS, J.L.H. *An evaluation of the KwaZulu extension service.* Alice: Agricultural and rural development research institute (ARDRI), 1983.

BENNETT, C.F. *Analyzing impacts of extension programmes.* Washington: USDA, 1976.

BENNETT, C.F. *Teaching materials on "seven levels of evidence": A guide for extension workers.* Washington: USDA, 1980

BENNETT, C.F. *Reflective appraisal of programmes (RAP): an approach to studying clientele-perceived results of cooperative extension programmes.* Ithaca: Cornell University, 1982.

BENOR, D. T & V: Putting intentions into practice. *INTERPAKS Interchange.* Urbana: University of Illinois, 1984.

BERNSTEN, R.H. Site selection in project area. *In:* SHANER, W.W., PHILIPP, P.F. *and* SCHMEHL, W.R. *ed.* *Readings in farming systems research and development*. Fort Collins: CID, 1981.

BOONE, E.J. The cooperative extension service. *In:* SMITH, R.M., AKER, G.F. *and* KIDD, J.R. *eds.* *Handbook of adult education.* New York: Macmillan, 1970.

BOWN, L. Scope and purpose of adult education in West Africa. *In:* BOWN, L. *and* OLU TOMORI, S.H. *eds.* *A handbook of adult education for West Africa*. London: Hutchinson, 1979.

BOWN, L. *and* OMOLEWA, M. The future. In: BOWN, L. *and* OLU TOMORI, S.H. *eds.* *A handbook of adult education for West Africa*. London: Hutchinson, 1979.

BROWN, W.M., JR. Constraints in effective extension programme development in third world countries: the manpower development and deployment issue. *In:* CLAAR, J.B. *and* WATTS, L.H. *eds.* *Knowledge transfer in developing countries: status, constraints, outlook.* Urbana: INTERPAKS, 1983.

BUTLER, L.M. *Baseline survey methodological report.* Pullman: Washington State University, 1982.

CALLAWAY, A. Frontiers of out-of-school education. *In:* BREMBECK, C.S. *and* THOMPSON, T.J. *eds.* *New strategies for educational development.* Lexington: Heath, 1973.

CAMPBELL, D.T. *and* STANLEY, J.C. *Experimental and quasi-experimental designs for research.* Chicago: Rand McNally, 1966.

CHAMALA, S. *and* KEITH, K.J. Development of extension programmes within the context of FSR and D - conservation cropping case in Queensland. *In:* BUTLER FLORA, C. *ed. Farming systems research and extension: implementation and monitoring. abstracts.* Manhattan: Kansas State University, 1984.

CLAAR, J.B., DAHL, D.T. and WATTS, L.H. *The cooperative extension service: an adaptable model for developing countries.* Urbana: INTERPAKS, undated.

CLARK, R.C. Organization for work. *In:* SANDERS, H.C. *ed. The land grant university's extension service.* Corvallis: Oregon State University, 1973.

COLLINSON, M. On farm research with a systems perspective as a link between farmers, technical research and extension. *Report of a networkshop on extension methods and research/extension linkages.* Nairobi: CIMMYT, 1984.

COOMBS, P.H. What it will take to help the rural poor. *In:* COOMBS,P.H. *ed. Meeting the basic needs of the rural poor: the integrated community-based approach.* New York: Pergamon Press, 1980.

DEUTCH, K.W. Developmental change: some political aspects. *In:* LEAGANS, J.P. *and* LOOMIS, C.P. *eds. Behavioural change in agriculture.* Ithaca: Cornell University Press, 1971.

DIAZ-CISNEROS, H. Plan Puebla: ten years of experience in promoting agricultural development among subsistence farmers of Mexico. In: NIEHOFF, R.O. *ed. Nonformal education and the rural poor.* East Lansing: Michigan State University, 1977.

DI FRANCO, J. Extension teaching is an art *and* Teaching vs. learning. *In:* MAUNDER, A.H. *author-ed. Agricultural extension: a reference manual.* Rome: FAO, 1973.

DIXON, M. *Farming systems research in Ethiopia.* Office de la Recherche Scientifique et Technique Outre-Mer, 1979.

DUVAL, G.H. *Groups in the practical extension situation - an organizational model.* Pretoria: University of Pretoria, 1978.

EASTER, G. *and* HLOPE, D. Constraints and opportunities to extension training in Swaziland. *In:* BUTLER FLORA, C. *ed. Farming systems research and extension: implementation and monitoring. abstracts.* Manhattan: Kansas State University, 1984.

ECKLUND P. *Technology development and adoption rates: systems approach for agricultural research and extension.* Lusaka: Swedish Embassy, 1983.

EICHER, C.K. *International technology transfer and the African farmer: theory and practice.* Harare: University of Zimbabwe, 1984.

FARRAR, C. AID's policies for education and rural development. *In:* NIEHOFF, R.O. *ed. Nonformal education and the rural poor.* East Lansing: Michigan State University, 1977.

FOURIE, P.C. The illusive concept of development. *Development studies Southern Africa.* Vol.4 no.1. Pretoria; Benso, October 1981.

FOX, D.J. *The research process in education.* New York: Holt, Rinehart and Winston, 1969.

FRESCO, L. Approaches to the study of farming and cropping systems. *In:* BUTLER FLORA, C. *ed.* *Farming systems research and extension: implementation and monitoring. abstracts.* Manhattan: Kansas State University, 1984.

FRUTCHEY, F.P. The learning-teaching process. *In:* SANDERS, H.C. *ed.* *The land grant university's extension service.* Corvallis: Oregon State University, 1973.

GEBREGZIABHER, B. A case study of the ARSSI rural development unit (ARDU). *In:* NIEHOFF, R.O. *ed.* *Nonformal education and the rural poor.* East Lansing: Michigan State University, 1977.

GREENWOOD, M.N. *New directions: the international mission of the cooperative extension service - a statement of policy.* Washington: USDA, 1984.

HARBISON, F.H. Human resources and nonformal education. *In:* BREMBECK, C.S. *and* THOMPSON, T.J. *eds.* *New strategies for educational development.* Lexington: Heath, 1973.

HARRINGTON, L.W. *and* TRIPP, R. *Recommendation domains: a framework for on-farm research.* CIMMYT economics programme working paper 02/84. Mexico: CIMMYT, 1984.

HARWOOD, R.R. *Small farm development: understanding and improving farming systems in the humid tropics.* Boulder: Westview Press, 1979.

HAWTIN, G.C. *et al.* The Nile valley project: a model for cooperation between international and national programmes in research and extension. *In:* BUTLER FLORA, C. *ed.* *Farming systems research and extension: implementation and monitoring. abstracts.* Manhattan: Kansas State University, 1984.

HAYAMI, Y. *and* RUTTAN, V.W. *Agricultural development: an international perspective.* Baltimore: Johns Hopkins University Press, 1971.

HILDEBRAND, P.E. Motivating small farmers to accept change. *In:* SHANER, W.W., PHILIPP, P.F. *and* SCHMEHL, W.R. *eds.* *Readings in farming systems research and development.* Fort Collins: Colorado State University, 1981.

HILDEBRAND, P.E. *and* WAUGH, R.K. Farming systems research and development. *FSSP Newsletter*. Gainsville. University of Florida, Springs 1983.

HILDEBRAND, P.E. Commentary. *Coming full circle: farmers' participation in the development of technology.* Ottawa: International Developmant Research Centre, 1984.

HILLIARD, J.F. Elements of an action program. *In*: Niehoff, R.O. *ed*: *Nonformal education and rural poor*. East Lansing. Michigan State University, 1977.

HUDGENS, R.E. Subregional issues in the implementation of farming systems research and extension methodology - a case study in Zambia. *In:* BUTLER FLORA, C, *ed*. *Farming systems research: extension implementation and monitoring abstracts*. Manhattan: Kansas State University, 1984.

JOHNSON, S.H. III *and* CLAAR, J.B. FSR/E: shifting the intersection of research and extension. *In:* BUTLER FLORA, C. *Farming systems research and extension: implementation and monitoring. abstracts.* Manhattan: Kansas State University, 1984.

JONES, J.H., JR. Sociological implications in extension. *In:* SANDERS, H.C. *ed.* *The land-grant university's extension service.* Corvallis: Oregon State University, 1973.

JONES, R.I. The systems approach in agriculture. *Proceedings of the Grasslands Society of Southern Africa.* Pietermaritzburg: ARI for Natal, 1978.

JONES, G. (University of Reading) Our problem-solving origins. *In:* JOHNSON, E.L. *ed* *INTERPAKS Interchange.* Urbana: University of Illinois , March 1984.

KALSHOVEN, G. *Providing agricultural services in rice farming areas. Malaysian and Surinam experience.* Wageningen: Agricultural University, 1981.

KELLOGG, E.D. Constraints to developing effective extension programmes in agricultural assistance programmes: some brief observations. *In:* CLAAR, J.B. *and* WATTS, L.H. *eds.* *Knowledge transfer in developing countries: status, constraints, outlook.* Urbana: INTERPAKS, 1983.

KELSEY, L.D. *and* HEARNE, C.C. *Cooperative extension work.* Ithaca: Comstock, 1949.

KIRBY, R., GALLEGOS, P. *and* CORNICK, T. *On-farm research methods: a comparative approach. experiences of the Quimiag-Penipe project, Ecuador.* Ithaca: Cornell University, 1981.

KLEENE, P. Experimental approaches in southern Mali. *Coming full circle: farmers' participation in the development of technology.* Ottawa: International Development Research Center, 1984.

KUMAR, A. Education for rural development. *In:* BOWN, L. *and* OLU TOMORI, S.H. *eds.* *A handbook of adult education for West Africa.* London: Hutchinson, 1979.

LA BELLE, T.J. Liberation, development and rural nonformal education. In: NIEHOFF, R.D. ed. *Nonformal education and the rural poor.* East Lansing: Michigan State University, 1977.

LAGEMANN, J. *Farming systems research as a tool for identifying and conducting research and development projects.* Turrialba: Tropical Agriculture Research and Training Center, 1981.

LAKER, M.C. Community development as applicable to agriculture. *Development studies Southern Africa.* vol.4 no.1. Pretoria: Benso, October 1981.

LEAGANS, J.P. Extension education and modernization. In: LEAGANS, J.P. and LOOMIS, C.P. eds. *Behavioral change in agriculture.* Ithaca: Cornell University Press, 1971.

LEAGANS, J.P. *Adoption of modern agricultural technology by small farm operators: an interdisciplinary model for research and strategy builders.* Ithaca: Cornell University, 1979.

LEE, D. *Lesotho farming systems research project 1979-1986 [position paper].* Maseru: FSR, 1985.

LEEDY, P.D. *Practical research: planning and design.* New York: Macmillan, 1974.

LOW, A. *Farming systems research in Eastern and Southern Africa [paper].* Mbabane: CIMMYT, 1984.

MAGAGULA, G.T. *A socio-economic analysis and evaluation of rural development areas in Swaziland.* (unpublished Ph.D. dissertation). University of Maryland. Ann Arbor: University Microfilms International, 1978.

MALONE, V.M. Human resources management: a constraint to successful extension services in international development work. *In:* CLAAR, J.B. and WATTS, L.H. *eds. Knowledge transfer in developing countries: status, constraints, outlook.* Urbana: INTERPAKS, 1983.

MATOBO, T., SEFEANE, A. and YOUMANS, D. *Final report on the training courses for village agricultural committees, March 29 - April 30, 1982 (RD-R-12)*. Maseru: Lesotho Ministry of Agriculture, 1982.

MATOBO, T. *et al. Final report on the training course on "professional improvement in agricultural extension" (RD-R-15).* Maseru: Lesotho Ministry of Agriculture 1982.

MATOBO, T. and TRAIL, T.F. *Evaluation of the workshop on "professional improvement in agricultural extension" (RD-B-8).* Maseru: Lesotho Ministry of Agriculture, 1982.

MATOBO, T. and TRAIL, T.F. *Extension and agricultural subject matter training needs of subject matter specialist, district extension officers, and extension assistants (RD-B-6).* Maseru: Lesotho Ministry of Agriculture, 1982.

MAUNDER, A.H. *Agricultural extension: a reference manual.* Rome: FAO, 1973.

MBOUBI, P.C. *Human resources in the agriculture of the Congo.* Paris: UNESCO, 1982.

MCDERMOTT, J.K. Gaps between research and extension missions. *In:* JOHNSON, E.L. *ed. INTERPAKS Interchange.* Urbana: University of Illinois, May 1984.

MCINTOSH, J.L. Indonesian cropping systems programme. *In:* SHANER, W.N., PHILIPP P.F. and SCHMEHL, W.R. *eds. Readings in farming systems research and development*. Fort Collins: Colorado State University, 1981.

MOIR, P.E. *Planning and evaluating structured international educational experiences* (unpublished paper). Vancouver: University of British Columbia, undated.

MOSHER, A.T. *Technical cooperation in Latin American agriculture.* 1957.

MOSHER, A.T. Agricultural development. *In:* LEAGANS, J.P. *and* LOOMIS, C.P. *eds. Behavioral change in agriculture.* Ithaca: Cornell University Press, 1971.

NESMAN, E.G. The basic village education project: Guatemala. *In:* NIEHOFF, R.O. *ed. Nonformal education and the rural poor.* East Lansing: Michigan State University, 1977.

NOBE, K.C. Organizational constraints to greater extension involvement in Agency for International Development - funded agricultural programmes in less developed countries. *In:* CLAAR, J.B. *and* WATTS, L.H. *eds. Knowledge transfer in developing countries: status, constraints, outlook.* Urbana: INTERPAKS, 1983.

NORMAN, D.W. The farming systems approach to research. *Farming systems research paper no.3.* Manhattan: Kansas State University, 1982.

NORMAN, D.W. *Some problems in the implementation of agricultural research projects with a farming systems perspective.* FSSP networking paper no.3. Gainsville: University of Florida, 1983.

NTIRI, G., MCLACHLAN, M. *and* PIGOZZI, M.J. Education and agriculture. *The NFE exchange.* East Lansing: Michigan State University, 1980.

PAIK, H.K. Nonformal education in Korea: programmes and prospects. *In:* BREMBECK, C.S. *and* THOMPSON, T.J. *eds.* *New strategies for educational development.* Lexington: Heath, 1973.

PATTERSON, A.V. Visual aids. *In:* SANDERS, H.C. *ed.* *The land-grant university's extension service.* Corvallis: Oregon State University, 1973.

PESSON, L.L. Extension programme planning with participation of clientele. *In:* SANDERS, H.C. *ed.* *The land grant university's extension service.* Corvallis: Oregon State University, 1973.

PICKERING, D.C. The role of agricultural extension and some issues concerning current methodologies in sub-saharan Africa. *Report of a networkshop on extension methods and research/extension linkages.* Nairobi: CIMMYT, 1984.

PLUCKNETT, D.L. Farming systems concepts arising from the TAC review and personal experience. *In:* SHANER, W.W., PHILIPP, P.F. *and* SCHMEHL, W.R. *eds.* *Readings in farming systems research and development.* Fort Collins: Colorado State University, 1981.

POEY, F. Conducting on-farm research by extensionists: an approach to effective transfer of technology. *In:* BUTLER FLORA, C. *ed.* *Farming systems research and extension: implementation and monitoring. abstracts.* Manhattan: Kansas State University, 1984.

RAHIM, S.A. Nonformal aspects of the Comilla (Bangladesh) project. *In:* NIEHOFF, R.O. *ed.* *Nonformal education and the rural poor.* East Lansing: Michigan State University, 1977.

RAMAKHULA, C.M. *Report on the nutrition course held at Nyakosoba research centre from the 1st to 4th March 1983 (RD-R-221.*

Maseru: Lesotho Ministry of Agriculture, 1983.

RAMAKHULA, C.M. *Report on the nutrition course held at Nyakosoba and Siloe research centres: Siloe from the 20-24 February 1984, Nyakosoba from the 7-11 May 1984 (RD-R-121).* Maseru: Lesotho Ministry of Agriculture, 1984.

RAUDABAUGH, J.N. In search of better service. *In:* VINES, C.A. *and* ANDERSON, M.A. *eds.* *Heritage horizons: extension's commitment to people.* Madison: Journal of Extension, 1976.

RICHARDSON, E.V. Knowledge transfer in less developed countries. *In:* CLAAR, J.B. *and* WATTS, L.H. *eds.* *Knowledge transfer in developing countries: status, constraints, outlook.* Urbana: INTERPAKS, 1983.

ROGERS, E.M. *Diffusion of innovations.* New York: The Free Press, 1983.

ROSE, C.J. *and* TAPSON, D.R. Small-farm systems research in Ciskei. *Development Southern Africa.* Vol.1 no.2. August 1984.

RUCKS, C. What kind of extension worker do we need? *In:* *1980 training for agriculture and rural development.* Rome: FAO, 1981.

SANDERS, H.C. A brief history *and* The legal base, scope, functions and general objectives of extension work. *In:* SANDERS, H.C. *The land-grant university's extension service.* Corvallis: Oregon State University, 1973.

SANDERS, H.C. *and* MAUNDER, A.H. Why an extension service today? *In:* SANDERS, H.C. *ed.* *The land grant university's extension service.* Corvallis: Oregon State University, 1973.

SAOUMA, E. FAO/CGIAR- "A common search." *News from CGIAR*. Washington: CGIAR, June 1984.

SASTRAVAHA, S. *Vocational agricultural education in Thailand.* Paris: UNESCO, 1982.

SCHRAMM, W. CHU, G.C. *and* YU, F.T.C. China's experience with development communications: how transferable is it? *In:* NIEHOFF, R.O. *ed.* *Nonformal education and the rural poor.* East Lansing: Michigan State University, 1977.

SCHUMACHER, A. World bank policies for rural development. *In:* NIEHOFF, R.O. *ed.* *Nonformal education and the rural poor.* East Lansing: Michigan State University. 1977.

SEFEANE, A.S. *Report on training of the village agricultural committees, July-August 1981.* Maseru: Lesotho Ministry of Agriculture, 1981.

SEFEANE, A.S. *Report on training course for chiefs of Molumong, Nyakosoba and Siloe at Matela farmers training centre 21-25 February 1983 (RD-R-24).* Maseru: Lesotho Ministry of Agriculture, 1983.

SEFEANE, A.S. *and* RAMAKHULA, C.M. *Report on training courses* (for) *extension workers and subject matter specialists* (in) *technical agriculture (RD-R-52).* Maseru: Lesotho Ministry of Agriculture, 1985.

SETSABI, A.M. *Nonformal education and training for productivity and self-reliance in Lesotho (paper).* Roma: National University of Lesotho, 1984.

SHANER, W.W., PHILIPP, P.F. *and* SCHMEHL, W.R. *Farming systems* *research and development: guidelines for developing countries.* Boulder: Westview Press, 1982.

SHANER, W. Linking extension with farming systems research. *In:* CLAAR, J.B. *and* WATTS, L.H. *eds.* *Knowledge transfer in developing countries: status, constraints, outlook.* Urbana: INTERPAKS, 1983.

SHARMA, M. *Planning and evaluating nonformal education: a systems model.* Ambala Cantt: Indian Publications, 1980.

SIGMAN, V.A. *and* SWANSON, B.E. *Problems facing national agricultural extension in developing countries.* Urbana: INTERPAKS, 1984.

SIMKINS, T. *Nonformal education and development.* Manchester: Manchester Monographs, 1976.

SMITHELLS, J.E. Agricultural extension work among rural women in selected developing countries. *Education in developing countries of the commonwealth.* Commonwealth secretariat, undated.

STONE, H.J.S. *The common and the divers: a profile of comparative education.* Isando: McGraw-Hill, 1981.

SWANSON, B.E. The role and contribution of agricultural extension in agricultural development. *In:* CLAAR, J.B. *and* WATTS, L.H. *eds.* *Knowledge transfer in developing countries: status, constraints, outlook.* Urbana: INTERPAKS, 1983.

TOWNSEND COLES, E.K. *Adult education in developing countries.* Oxford: Pergamon Press, 1977.

TOWNSEND COLES, E.K. *Maverick of the education family.* Oxford: Pergamon Press, 1982.

TRENT, C. Lay leadership. In: SANDERS, H.C. ed. *The land grant university's extension service.* Corvallis: Oregon State University, 1973.

TRAIL, T.F. *Communications channels and sources of agricultural information utilized by farmers in the farming systems prototype areas of Siloe, Nyakosoba and Molumong in Lesotho (RD-B-71).* Maseru: Lesotho Ministry of Agriculture, 1982.

TSIU, L.D. *Report on training of VAC's of Molumong at Mokhotlong FTC on 14 - 18 March, 1983. (RD-B-23).* Maseru: Lesotho Ministry of Agriculture, 1983.

VAN ROOYEN, J. A farm system approach. *Development Southern Africa.* Pretoria: May 1984.

VAN ROOYEN, J. Farming systems research in less developed agriculture: the CGIAR network. *Development Southern Africa.* August 1984.

VERMAAK, D. Workshop on the relationship between development and education and the role of non-formal education. *Digest of multilateral activities.* Pretoria: Interim Secretariat of the SATBVC States, April 1984.

VITZTHUM, E.F. and FLORELL, R.J. The cooperative extension heritage. In: VINES, C.A. and ANDERSON, M.A. eds. *Heritage horizons: extension's commitment to people.* Madison: Journal of Extension, 1976.

WARD, T., DETTONI, J. and McKINNEY, L. Designing effective learning in nonformal modes. In: BREMBECK, C.S. and THOMPSON, T.J. eds. *New strategies for educational development.* Lexington: Heath, 1973.

WARD, T.W. and HERZOG, W.A., jr. *Effective learning in nonformal education.* East Lansing: Michigan State University, 1977.

WASHINGTON STATE UNIVERSITY. *Faculty Manual.* Pullman: WSU, October 1984.

WATTS, L.H. *and* CLAAR, J.B. Knowledge transfer for agricultural development: history-limitations-importance. *In:* CLAAR, J.B. *and* WATTS, L.H. *eds.* *Knowledge transfer in developing countries: status, constraints, outlook.* Urbana: INTERPAKS, 1983.

WAUGH, R.K. *The transfer of technology to farmers of small land holdings (paper).* Guatemala: ICTA, 1978.

WIJESSORIYA, R.A. *Cropping systems pilot production programme in Sri Lanka.* Los Banos: IRRI, 1980.

WINKELMANN, D. *The adoption of new maize technology in Plan Puebla, Mexico.* Mexico, CIMMYT,1976.

WINKELMANN, D. *and* MOSCARDI, E. Aiming agricultural research at the needs of farmers. *In:* SHANER, W.W., PHILIP, P.F. *and* SCHMEHL, W.R. *eds.* *Readings in farming systems research and development.* Fort Collins: Colorado State University, 1981.

YANG, H. *Fact-finding with rural people.* Rome: FAO, 1955.

YORK, E.T., jr. A look to the future. *In:* SANDERS, H.C. *ed.* *The land grant university's extension service.* Corvallis: Oregon State University, 1973.

YOUMANS, D. V. Extension education abroad: an adventure in human sharing. *In:* BLUME, G. *ed.* *Journal of extension.* Madison: University of Wisconsin, March/April 1979.

YOUMANS, D.V. and SEFEANE, A. *Final report on the training* course on "extension for improvement of farming systems" (RD-B-13). Maseru: Lesotho Ministry of Agriculture, 1983.

YOUMANS, D.V. and HOLLAND, D. Extending FSR results in Lesotho. In : KEARL, S. ed Farming systems support project newsletter. Gainsville: University of Florida, third quarter, 1983.

YOUMANS, D.V. A new model for the education of village agricultural committee members at Nyakosoba and Siloe, Lesotho - April 12 - 21, 1983. (RD-B-15). Maseru: Lesotho Ministry of Agriculture, 1983.

YOUMANS, D.V. A research division response to subject matter specialists' continuing educational needs. (RD-B-31). Maseru: Lesotho Ministry of Agriculture, 1983.

YOUMANS, D. V. Farming systems research as an extension concept (paper) Maseru: Institute for Extra-Mural Studies, 1984.

YOUMANS, D.V. End of tour report. Farming systems research in Lesotho: Annual report. Maseru: Washington State University, 1984.

YOUMANS, D.V. Linkage question in Lesotho. In: JOHNSON, E.L. ed INTERPAKS Interchange. Urbana: University of Illinois, March, 1985.

YOUMANS, D.V. Lesotho chiefs remembered. INTERPAKS Interchange. Urbana: University of Illinois, July 1985.

YOUMANS, D.V. RAMAKHULA, C, and LEE, D.J. The extension challenge: a research report on ten extension schools for agricultural professionals in Lesotho (RD-B-48). Maseru: Lesotho Ministry of Agriculture, 1985.

SUMMARY

Farming systems research is an approach to agricultural development in which farmers join scientists in mutual, interdisciplinary problem solving activities on farmers' lands. In that context, extension education, a nonformal mode developed in the agricultural setting, plays a central and vital role in the dissemination of information and the diffusion of innovations.

The farming systems research and extension strategy has been at work in Lesotho since 1979 as a fully integrated policy in the Research Division of the Ministry of Agriculture and Marketing. Funded by the United States Agency for International Development, faculty members of Washington State University have worked as advisors and colleagues with national officers and members of farming communities in carrying out appropriate activities.

Extension education programmes have been conducted among a number of clienteles since 1981, addressing such areas of need as rural organization, village leadership, extension methods, and technical agriculture from a variety of fields and at several levels of instruction. Members of organized farmer contact groups as participants and diffusors, village chiefs and headpersons, and government extension workers and

subject matter specialists were three key target groups for extension education programmes.

This study concentrated on a threefold task. First, it undertook to review and substantiate the role and dynamics of extension education in agricultural development, in general and as reflected in farming systems research activities in Lesotho. Second, it sought to assess the impacts of extension education programmes in the above context in terms of changes in knowledge, attitudes, skills, aspirations (KASA), agricultural practices and, where possible, end results, using a reflective appraisal of programmes (RAP) methodology to ascertain those outcomes. Third, it expected to formulate conclusions and advance recommendations for the improvement of future such programmes based on the evidence thus derived, together with any other discoveries made during the course of the study.

In basing this research on the 1979 - 1984 segment of the farming systems research intervention in Lesotho, and in seeing it through to its contemplated closure, the researcher concludes that the outcomes demonstrate that there have been positive though tentative, KASA changes among the three key clienteles perceived by their members as directly related to the extension education programmes under study. Likewise, practice change in all three groups, while more variable, was encouraging as vividly described by the participants themselves. Finally, end results, best seen among the farmer contact groups, indicated such real benefits as better meals for families, higher crop yields, improved condition of animals and increased incomes. The members of those same farmers groups had become promising disseminators and diffusors, reaching nearly nine other farmers each.

It is further concluded that, while farming systems research is neither a panacea for low productivity nor a blueprint for Africa, it is a useful and dynamic development strategy, and that, as in other strategies, extension education is both central and critical to dissemination of information and diffusion of innovations. Extension education programmes, designed according to available resource levels, do enhance positive change in participants' learning, practical behaviour and end benefits. Women, as a dynamic human resource in the development formula, must be considered in the design and delivery of extension programmes. And, urgent research into extension education for the developing world is required so that new, flexible and realistic methodologies might be perfected to meet the challenge of the millennium.